AN ECONOMIC GEOGRAPHY OF THE BRITISH EMPIRE

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KILBURN GRAMMAR SCHOOL

WITH 41 MAPS AND DIAGRAMS AND
A STATISTICAL APPENDIX

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PREFACE TO THIRD EDITION

A SHORT Appendix has been added dealing with South-West Africa and the Tanganyika Territory, the largest of the old German colonies to come under British control.

Slight corrections have been made in the text, and a few foot-notes have been added where necessary.

As complete commercial statistics for the first post-war year, 1919, are not yet available the 1913 tables have been allowed to stand, although several important changes have been pointed out in the foot-notes.

C. B. T.

October, 1920.

PREFACE

The importance of the economic aspect of geographical science, demanding not only a record of the various features and phenomena of the earth's surface, but also an understanding of their relation to one another and more especially of their control of human life and activity, is now fully recognised, and this book attempts to work out on these lines the geography of those parts of the world occupied or controlled by the British people. For this purpose the British Empire affords a field of study almost as wide as the world itself, for it presents physical features, climates, plants, animals and peoples of every type.

The widely different modes of life and even the mental outlook of the Canadian farmer, the Australian squatter, the South African miner, the Indian ryot, the South Sea islander and the town-dweller of the mother country are very largely the result of their geographical environment; and the causes and possible solutions of many Imperial problems cannot be clearly understood without a knowledge of the geographical conditions underlying them.

The fact is not overlooked that civilised man is able to modify in many ways and, in cases, even to

overcome the control which geographical conditions exerted upon his ancestors. Among the more striking examples of this within the Empire may be noted such works as the deepening of the Clyde estuary, the construction of the Canadian Pacific Railway across the Rocky Mountains, the establishment of submarine cables and wireless stations, the building of the great dam at Aswan, and the artesian well and other irrigation schemes undertaken in the dry lands of Australia.

Some aspects of this action and reaction between man and his geographical environment are first considered with reference to the Empire as a whole, and then each unit is dealt with separately in as great detail as space permits and its interest or importance warrants. Statistics from the most reliable official sources have been used more often than quoted in order to make accurate comparisons, and in matters of commerce those used have been for the last available year before the disturbing influence of the Great War was felt.

With regard to the ultimate effect of the war upon the geography of the Empire little can or need be said now. Egypt, which had long been really, though not nominally, under British control, is considered in some detail, but other territorial redistributions resulting from recent hostilities have not been noted because they may not be final, and their importance to the Empire as a whole is relatively small. Their economic conditions may also be readily understood

by comparison with the neighbouring parts of the Empire here described. The influence of the geography of the Empire upon the course of the war has, however, been touched upon in several of the chapters, notably that on "Links of Empire."

It is hoped that the book will be found particularly useful to teachers and older students in Secondary Schools, as providing the "recapitulation from the point of view of the British Empire" demanded by the Geography Syllabus for London Matriculation; and it should also be of considerable value to Commercial Classes and to Continuation Schools working upon modern lines.

My colleague, Mr. S. Burton, B.A., has very kindly read the whole of the proofs and made many valuable suggestions.

C. B. T.

Kilburn, N.W.,
February 1916.

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PART I

THE EMPIRE AS A WHOLE

CHAPTER I

THE BOUNDS OF EMPIRE

Size and Distribution—Maps of the Empire—Time Differences.

THE British Empire, which comprises all those parts of the world whose inhabitants own allegiance to the British sovereign, has an area of about 13,000,000 square miles, or half as large again as the Russian Empire and larger than the whole of Africa. It thus includes nearly a quarter of all the land-surface of the globe, with over 400,000,000 inhabitants, or a quarter of the world's total population.

But, unlike the Russian Empire, it consists of many isolated territories of all shapes and sizes, varying from the three and three-quarter million square miles of Canada to the two square miles of Gibraltar, and scattered all over the globe, from the Arctic to the Antarctic and from furthest east to furthest west. There are thus found within it every type of scenery, from the snow-capped peaks of the Himalaya to the sun-baked plains of Australia; every type of climate, from the hot and steamy Gold Coast to the biting cold of northern Canada; every type of plant, from the lichen of the mountain top and tundra to the

enormous Douglas Pines of Vancouver; every useful animal and mineral and every type of humanity, from the degraded cannibals of the Kalahari and Borneo to the highest types of modern civilisation.

The advantages conferred by this variety are fairly obvious, but the scattered nature of the Empire, perhaps, has its drawbacks.

In times of peace central control and unity of government are difficult to exercise and achieve; in times of war the possible points of attack are innumerable, and a navy sufficiently large to secure the control of all the seas of the world is absolutely necessary if the Empire is to be held together. But recent events have proved that the former has been a blessing in disguise and the latter by no means impossible. For by delegating the control of the distant parts of the Empire to those who are most fully acquainted with local needs and circumstances, the mother country has allowed to grow up a number of strong and self-reliant colonies who rallied with one heart and voice in the time of common need, and proved to the world the material as well as the moral value of the British ideal of freedom. And when engaged in war with the next strongest Naval Power, no part of the Empire ever fell into enemy hands, and the steady stream of British commerce flowed on unchecked.

Maps of the Empire

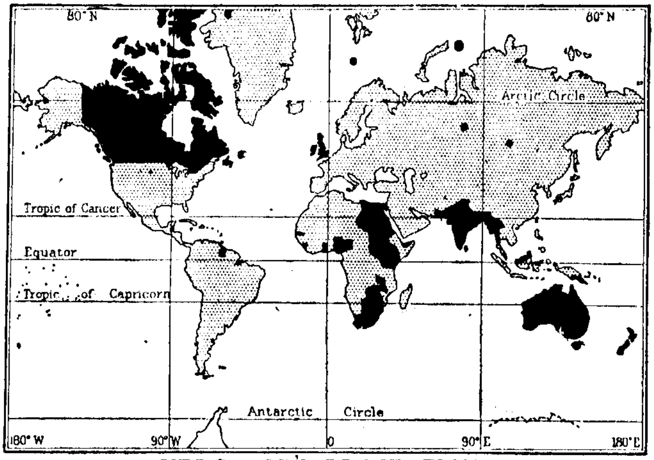
As the various parts of the Empire are so widely distributed over the earth's surface, the only way in which the different units can be accurately represented in shape, size and position is upon a globe; and, as it is impossible to flatten out a spherical surface completely, all attempts to show the various parts of the Empire on a flat map contain certain errors.

Perhaps the commonest form of map used is that known as *Mercator's Projection*, produced theoretically by " projecting " the globe upon a cylinder tangential

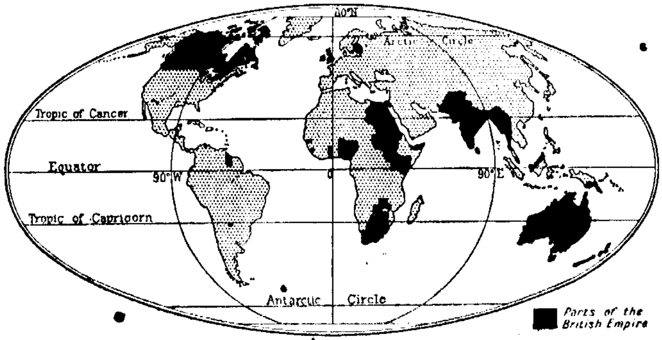
to the sphere at the Equator. The practical effect is to make all meridians of longitude parallel instead of converging at the poles as on the globe, and the consecutive parallels of latitude become proportionately wider and wider apart as the distance from the Equator increases. The obvious effect of this is to enlarge the apparent area of all countries lying far from the Equator out of all proportion to their real size; *e. g.* Canada, which is really less than a third of the size of Africa, appears nearly equal to it on this map. And perhaps the absurdity of using this projection for comparing size is most strikingly shown by noting that upon it the North Pole or the South Pole becomes a line as long as the Equator and at an infinite distance from it! Consequently, polar regions are never mapped upon Mercator's Projection. But its great value lies in the fact that all directions from point to point marked upon it are true; that is to say, that if on the map one port appears to lie south-west of another port, then that will be the true compass bearing of the first from the second in actual practice. For this reason Mercator's Projection is used on all navigating charts except those of the polar regions, and on maps showing various geographical distributions in which direction is an important factor, *e. g.* winds and ocean currents.

Another projection in fairly common use is *Mollweide's Equal-Area Projection.* In this, as in reality, the central meridian is made just half the length of the Equator and at right-angles to it, and consecutive parallels of latitude are made equidistant. Other meridians, however, are curved lines of varying length, the line of 180° being enormously exaggerated. But they are so drawn that any areas of the network on the map are exactly proportional to their corresponding areas on the globe, so that the areas (but not the length and breadth) of countries shown on this projection are in correct proportion. It is obvious, however, that there is considerable distor-

tion of shape, especially near the edges, and that a "north-and-south" line drawn on the map in one



MERCATOR'S PROJECTION.
FIG. 1.



MOLLWEIDE'S PROJECTION
FIG. 2.

place is not necessarily parallel to any other line representing a similar direction at another point.

The areas of the different parts of the Empire shown on the two maps should be compared, the Equator being the same length in each case.

Other projections are used for constructing maps of the separate countries or parts of countries, various modifications being introduced to reduce errors of size and shape to a minimum.

Time Differences

Although, on account of its vast extent, the British Empire is one upon which "the sun never sets," as the sun only illuminates one-half of the world at any one moment, it is obvious that when it is noonday at one part of the Empire it is midnight at another on the opposite side of the globe. Now that business can be transacted by cable between places that lie on opposite sides of the world, the actual operation only taking a few minutes, it is very necessary for the parties concerned to have some knowledge of the time of day at the points in question. In a country as wide as Canada, too, where the sun reaches its highest point at towns on the Atlantic coast while it has not long risen above the horizon for places along the Pacific shore, it is quite impossible for all cities to observe the same time. It would be equally inconvenient also if each individual place along a railway such as the Canadian Pacific were to set its clocks according to its own local noon. Consequently the country is divided into a number of zones, all towns within each zone keeping the same time, which differs by just an hour from that of places situated in the adjoining zone. The standard times fixed at various places is based upon the following considerations, which can be easily understood by reference to a globe.

1. As the earth rotates from west to east the sun reaches its highest point for the day at the same moment for all places situated on the same line of longitude (*e. g.* when it is noon in London it is also

noon in Accra on the Gold Coast). For this reason the lines of longitude are spoken of as "meridians" or "mid-day" lines.

2. Places on a meridian lying to the east of the meridian in question have their noon at an earlier hour, while places lying on a meridian to the west do not get mid-day till later on; *e. g.* when it is noon in London it is afternoon at Calcutta to the east, but forenoon at Ottawa to the west.

3. The earth makes one complete revolution through 360° of longitude in a day of twenty-four hours. Therefore it turns through 15° in one hour or 1° in four minutes.

From these considerations it will be seen that when it is noon at Greenwich, at Aden, which lies on the meridian 45° E. of Greenwich, it will be 3 ($=\frac{45}{15}$) hours after noon, or 3 p.m., while at Barbadoes, which lies on the meridian 60° W., it will be 4 ($=\frac{60}{15}$) hours before noon, or 8 a.m.

The five time zones of Canada are based on the meridians of 60°, 75°, 90°, 105° and 120° W. of Greenwich respectively, so that when it is noon in London it is 8 a.m. at all places in the Atlantic Zone, 7 a.m. in the Eastern Zone, 6 a.m. in the Central Zone, 5 a.m. in the Mountain Zone, and 4 a.m. in the Pacific Zone. In Australia the four eastern states base their time on the meridian 150° E., and consequently when it is noon at Greenwich it is 10 p.m. at Brisbane, Sydney, Melbourne and Hobart. Western Australia takes the time for 120° E. as its standard, giving 8 p.m. as its corresponding time for Greenwich noon, while 9.30 p.m. is the standard time at the same moment in South Australia.

An interesting question arises in the case of the Fiji Islands, which lie 180° east and west of the Greenwich meridian. Therefore, when it is noon at Greenwich it is obviously either twelve hours after or twelve hours before noon, which means midnight in either case. But is it midnight of the same day

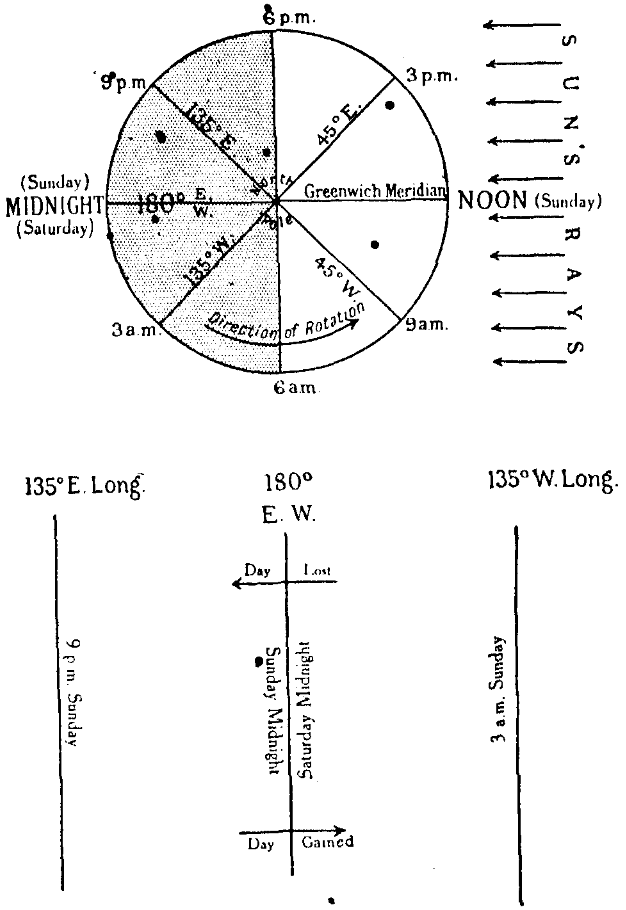


Diagram explaining Time Differences in different parts of the Empire

FIG. 3.

as is being observed at Greenwich, or of the day before? Let us suppose that we are considering a

moment when it is noon on Sunday at Greenwich. Then at Suva, the capital of Fiji, which is not quite 180° E., it is obviously nearly midnight on Sunday according to our previous method of reckoning. But at islands of the group which are not quite 180° W. it is certainly nearly twelve hours *before* Sunday noon, *i. e.* only just after Saturday midnight. So that at Suva, Sunday is finished, while on the next island it is only just beginning. This inconvenience is overcome by fixing an International Date Line, which deviates slightly from the meridian of 180° so as to include all islands of the Fiji Group, and also the neighbouring groups of Samoa, the Friendly Islands and the Kermadec Islands on one and the same side of the line.

But a ship crossing the Pacific, say, from New Zealand towards America, in crossing this line passes from a place where Sunday is finished to a place where Sunday is beginning, and so its passengers get two Sundays following each other. This is an example of the well-known phenomenon of "gaining a day." A ship travelling in the reverse direction, however, "loses a day" by passing from a place where Saturday has only just finished to a place where Monday is beginning, Sunday apparently having been dropped from the calendar.

CHAPTER II

PHYSICAL FEATURES AND THEIR ECONOMIC IMPORTANCE

The Sea—Lakes and Rivers—Highlands and Lowlands.

THE importance of the physical features of a region in determining the economic condition of its inhabitants can hardly be overestimated; for such contrasts

as are presented by the lives of the tribesmen of the mountainous North-West Frontier and of the Hindus of the plain of Northern India, or of the fishermen of Newfoundland and the farmers of Saskatchewan are almost entirely due to the nature of the country in which they live.

The sea, which covers about three-quarters of the earth's surface, exerts a most powerful influence, not only indirectly through its climatic effects, which will be considered later, but also directly. For the dwellers by its shores early discovered the immense and valuable supplies of food it contained, and exercised their ingenuity in capturing them. This soon led to the building of boats and ships, which would increase the available area of supply, and man gradually learnt to gain control over the vagaries of wind and wave. With increase of skill and confidence the more hardy spirits, led by the lure of the sea, launched out to find new lands, and this initiated the era of exploration that has now opened up practically the whole land-surface of the globe to man's varied activities. The British Empire, obviously the creation of a seafaring race, is indeed a striking monument to the influence of the sea, to which also in no small degree may be attributed the characteristic courage, enterprise, endurance, resource and love of freedom of the British people. The sea, which serves to divide as well as to unite the scattered units of the Empire, has made the British people the greatest shipbuilders and shipowners of the world. For three ships out of every five that sail the seas have been built in British shipyards, and almost half the merchant ships afloat fly the red ensign of the British Merchant Service.

The shallow seas have the greatest economic influence and value, for in the first place these are the resorts of the largest numbers of edible fish; and near the shores of the continent they convert the comparatively small effect of the tidal wave

of the open ocean into a large tidal current, which carries big ships far inland up the river estuaries. The two largest and most valuable fishing grounds in the world, the Banks of Newfoundland and the Dogger Bank, lie within easy reach of British ports, and the natives who live around the shallow seas of the Malay Archipelago are well known as fishermen. The situation of London, sixty miles from the open sea, is partly due to the far-reaching effects of the tide.

Of the ten largest cities of the Empire, nine are seaports.

With the single possible exception of its antithesis, the desert, the sea makes the finest type of political frontier, the coastline being most distinctly and obviously marked and most easily defended from hostile attack. This is emphasised where all a country's frontiers are sea frontiers, as in the case of Britain, whose island position has probably been the most influential factor in her development (see p. 53).

Lakes if sufficiently large are valuable as commercial highways and often abound in fish, as in the case of the Great Lakes of Canada, which also make a good political frontier. Lake Nyasa also forms part of the boundary between Nyasaland and Portuguese and German East Africa. The Canadian lakes also perform useful service in filtering the waters of the St. Lawrence, and thus preventing the formation of a sand bar, or delta, at the mouth.

Smaller lakes make good natural reservoirs of drinking water, as in the case of Loch Katrine and Glasgow, or stores of water for canals and electric power stations. If a lake has no outlet, and lies in a hot, dry region, it is often possible to collect valuable quantities of salt from its shores at the times of greatest evaporation. Such lakes are found on the borders of the Thar Desert in India, and there are valuable "salt-pans" in the drier part of the Free State in South Africa.

Rivers are of the greatest economic importance. Not only do they provide a cheap and easy means of communication where navigable, but the valleys they have carved out are often of enormous value in facilitating the construction of roads and railways, as, for example, in the case of the Aire and Ribble Valleys across the Pennines, and the Nile Valley across the desert plateau of Northern Egypt. Their upper courses, too, are often valuable sources of power and drinking water. As communication across them is easy unless they have carved deep gorges, they do not make really good political frontiers, but are often used to mark off administrative divisions of the same territory; *e. g.* the Thames forms part of the boundary of nine different English counties, and the Murray is the greatest part of the boundary between Victoria and New South Wales. The gorges of the Godaveri and Kistna, deeply cut into the Deccan Plateau of India, isolate the more or less independent native state of Hyderabad from the British Provinces on either side.

Where the river valleys are reasonably wide and open and the climate happens to be congenial they have become the greatest centres of human activity; for, added to facilities of communication, there is usually a fertile soil, often created by the river itself, and facilities for irrigation which favour settled agricultural industries and communities and a consequent progress in civilisation. The ancient culture of the Egyptians in the Nile Valley and of the Hindus in the valleys of the Indus and Ganges is typical.

Mountains exercise considerable control over economic development. If sufficiently high they make good frontiers, easily marked and fairly easy of defence, the Himalaya providing a striking example, which is more strongly emphasised by the vastly different regions on either side. To the north lies the high and inhospitable plateau of Tibet with its nomad population, and to the south the hot and

fertile lowlands of the Indo-Gangetic Plain with its careful cultivators, many of whom have never moved a mile from their native village in all their life. They act, too, as climatic barriers protecting the plains from cold winds, as again in the case of the Himalaya, or from rain, as in the case of the Rocky Mountains of British Columbia, which drain the westerly winds of their moisture before they reach the plains of Alberta. As health resorts in tropical countries inhabited by Europeans, mountains are invaluable. By causing the deposition of rain and snow they give rise to rivers which fertilise the plains at their foot, and often irrigate lands which would otherwise be desert. The Darling and its tributaries in Australia, the Nile and the Indus and many other instances might be quoted. The catching of supplies of water which percolates through the porous rocks of the highlands and can be obtained from springs or by boring artesian wells in the dry plains many miles from the foot of the mountains, as in Queensland, is another of the services of mountains to mankind. With the using up of supplies of coal and oil, the power to be derived from rushing mountain torrents is becoming daily more important. Aluminium works in Glenmore, cotton mills in Bombay, and gold mines in Australia, all derive power from such sources. Mountains, too, are storehouses of mineral wealth, especially where they have been formed by the folding of the earth's crust, bringing a number of different rock layers to the surface. The varied mineral wealth of British Columbia and of the Eastern Highlands of Australia are instances of this. The windward slopes of mountains near the sea are often richly forested on account of the heavy rainfall, the forests of Kauri Pine in New Zealand, of teak on the Western Ghats and the mountains of Burmah, and of the giant Douglas Pine in British Columbia being typical; and the varied climates at different levels in a mountain

region give rise to a corresponding variety of useful products in a very small area, contrasting very strongly with the monotony of productions often found in a plain.

The great disadvantage of a mountain chain, which is accentuated when, as is often the case, there is a whole series of parallel ridges and valleys, is the obstacle it presents to communication and commerce. *Natural passes*, then, assume great importance, especially if the districts at either end are productive. The Aire Gap across the Pennines, carrying a road, a canal, and two main lines of railway connecting the busy coalfields of the West Riding of Yorkshire and South Lancashire, is a case in point. The Crow's Nest and Kicking Horse Passes which carry the Canadian Pacific Railway across the Rockies, and the Khyber Pass, through which have come several invasions of India and through which go the mule and camel caravans en route to and from Afghanistan, are other well-known examples. The hard and isolated conditions of life that the mountains impose upon those who dwell in the valleys among them are often reflected in the strong, rugged, independent and often anti-social character of the inhabitants. This is most strongly seen in the case of the Pathan tribesmen of the north-west frontier in India, who are a constant source of trouble to the British Government.

Plateaus usually present a monotony of scenery and productions, as in the case of the Great Veldt in South Africa, especially if their formation, as is often the case, is due to the horizontal lie of rock strata over large areas. For this gives the surface and soil a uniformity which is reflected in plants and scenery. Then, too, if the plateau is high, most of the rain-bearing winds are denuded of their moisture in ascending to the plateau, which in consequence is liable to drought. Owing to the horizontal lie of the strata and to the drought, rivers rising in the

higher edges of the plateau incise deep gorges into the tableland, and their valleys are consequently useless for communication or irrigation, and, as they often descend from the plateau to the coastal plain in a series of rapids, they are of little value for navigation. Their valleys are also obstacles to the construction of roads and railways, which otherwise have the advantage of small gradients. The Orange River and the rivers of the Deccan are typical examples. So, unless a plateau is broken through by rich mineral-bearing strata, as in the Transvaal, Rhodesia, and Hyderabad, it is usually of small economic importance; but in tropical regions, where the rainfall is sufficient, the elevation, by reducing the temperature, often allows of the development of the plateau as a cattle-rearing region by European farmers. Another drawback to a plateau region is the unindented nature of its coasts making the construction of artificial harbours, as at Cape Town, necessary for its development.

Great plains, as in Central Canada and South-East Australia, are of great value for grazing and for agriculture if the climate is suitable. For their soil is usually fertile, and if rainfall is scarce it can generally be supplemented by irrigation from rivers or artesian wells. Agricultural operations are easy, and the construction of roads and railways present few difficulties. Where they cross the natural waterways market towns soon grow up as centres for the interchange of produce and ideas between the farmers of the neighbourhood. The undeveloped plains are used as cattle or sheep ranches, the vast herds being tended by the semi-nomadic Canadian "cowboys," or Australian "squatters," who almost live in the saddle.

CHAPTER III

CLIMATES OF THE EMPIRE

Causes and Economic Effects of Various Types—Natural Regions.

If physical features are important in determining the lines of economic development, a still more important factor is climate. For upon it depend the various forms of plant and animal life that are found in different parts of the globe, and to a large extent the mode of life of the inhabitants. The striking differences between the life of the Esquimo of Northern Canada and the Fiji islander, or between that of the Boer farmer of the veldt and the lumberer of Vancouver, are almost entirely due to differences of climate.

The climate of any region is determined by a number of factors, the more important of which are latitude, altitude, distance from the sea, prevailing winds, position of mountains, and ocean currents.

(*a*) *Latitude* chiefly affects temperature by determining the angle at which the sun's rays strike the earth's surface. Places within the tropics receive the rays more directly than places nearer the Poles, and as this gives greater concentration of heat and less loss through absorption in passing through the earth's atmosphere, tropical lands have a much higher mean temperature than the polar regions. This difference would be still more marked were it not for the fact that, owing to the earth's axis being inclined to the plane of the earth's orbit round the sun, the polar regions receive long periods of sunlight at one period of the year. For whereas at the Equator the sun is above the horizon for twelve hours on every day of the year, at the Poles it remains above the horizon throughout the six summer months, and is never seen at all for a corresponding period

in the winter. Intermediate places have varying lengths of summer and winter days according to their latitude. For example, in the latitude of London the sun is above the horizon for about sixteen hours a day at the end of June, and only eight hours at the end of December. These differences affect the *range* of temperature, *e. g.* at Singapore there is a difference of only two degrees Fahrenheit between the mean temperature of the hottest and coldest months, while at St. John's, Newfoundland, there is a difference of thirty-six degrees. Thus latitude divides the world roughly into—

1. *A hot belt* where, if rainfall is sufficient, human wants are few and easily supplied, and the people are indolent and unprogressive. Where rainfall is scanty, life is practically impossible, except where more energetic people from the temperate zone have intervened and overcome this difficulty by irrigation.

2. *A cold belt* in which the conditions of life are bad and discouraging, and in which the most must be made of the long, light, warm summer days to secure supplies of food and clothing for the cold, dark winter. The struggle to live leaves little time for higher development.

3. *The temperate zone,* lying between these two, where nature and man working together have produced the highest types of civilisation.

(*b*) *Altitude* reduces temperature, for the higher layers of the atmosphere are cooler than those nearer the earth's surface. The average reduction is about 1° F. for 300 ft. of ascent. In consequence mountains and tablelands in temperate regions are bleak and uninhabitable, as in the Highlands of Scotland; but in the tropics such regions are healthy and capable of considerable economic development by Europeans, as in Rhodesia.

(*c*) *Distance from the sea* tends to diminish rainfall and to increase the range of temperature, for land both heats and cools more quickly than the sea,

and therefore accentuates the differences of temperature between day and night, and between summer and winter. Lack of rainfall and extremes of temperature are both inimical to tree-growth, and interior regions are therefore chiefly grass land, scrub, or desert.

(*d*) *Prevailing winds* affect both temperature and rainfall. For if they come from warmer latitudes they increase the temperature of the lands to which they blow, and if they come from over the sea they bring moisture; *e. g.* the prevalent south-westerly winds of the British Isles largely account for the mild winter climate, and the prevalent south-easterly winds of Natal are largely responsible for its heavy rainfall. Winds from higher latitudes, or which have blown over large land areas are, of course, opposite in effect. Winds from the sea also carry inland the equalising influences of the sea, and the equable climate of the Pacific coast of Canada, so strongly contrasted with the extremes of the Atlantic shores, is chiefly due to the prevailing south-westerly winds of that part of the world.

The more important belts of prevailing winds may be noted.

1. *The Trade Winds* blow steadily across the oceans within the tropics towards the equatorial region of high temperature and low atmospheric pressure from the relatively cooler regions to north and south. The rotation of the earth gives them a north-easterly and south-easterly direction, respectively, in the northern and southern hemispheres. In the regions affected by these winds east coasts, of course, receive a much heavier rainfall than west coasts, and the western sides of such countries are usually desert. This is strikingly shown by the difference between the coastal districts of New South Wales and Western Australia, which are in the same latitude and lie in the track of the South-east Trade Winds.

Where the two wind systems meet is a belt of calms, and the rising air, cooled in its ascent, deposits the moisture it has collected by passing over warm seas in torrential downpours often accompanied by violent thunderstorms so typical of equatorial regions. This belt of great heat and rainfall moves gradually northward and southward within the tropics with the apparent movement of the vertical mid-day sun, and corresponds with the Equator only in March and September. Countries along or near the Equator, such as British East Africa, British Guiana and the Straits Settlements, have therefore two fairly well-marked wet seasons; while nearer the actual tropics the two wet seasons occur so close together as to become really one. This is the case in the Sudan, where "the rains" fall between April and October; while in South Africa the wet season is between October and April, the summer months in each case.

Although less important than in the days of sailing ships, these steady Trade Winds are of considerable service to navigation; while the calms, known as the *Doldrums, do not present the obstacles to a modern* liner that made them dreaded by the sailors of old.

2. *The Westerly Winds*, known in the southern hemisphere from the latitudes in which they are usually encountered as the Roaring Forties, blow fairly steadily between the latitudes of 40° and 60° in both hemispheres. In these regions west coasts are milder and wetter than eastern, and, in consequence, usually well timbered; the British Isles, British Columbia, and the South Island of New Zealand exhibiting these features. The steady flow of the Westerlies is often interrupted by *cyclones*, or centres of low pressure into which the air flows from all sides with a circular motion, and, rising in the centre, occasions varying winds, clouds and rain in the districts across which they pass. By means of these cyclones even the eastern sides of countries in the west-wind belts get considerable rainfall, and

there is nothing to correspond with the deserts of the Trade Wind areas. Most of the rainfall of the

PREVAILING WINDS AND CLIMATIC REGIONS

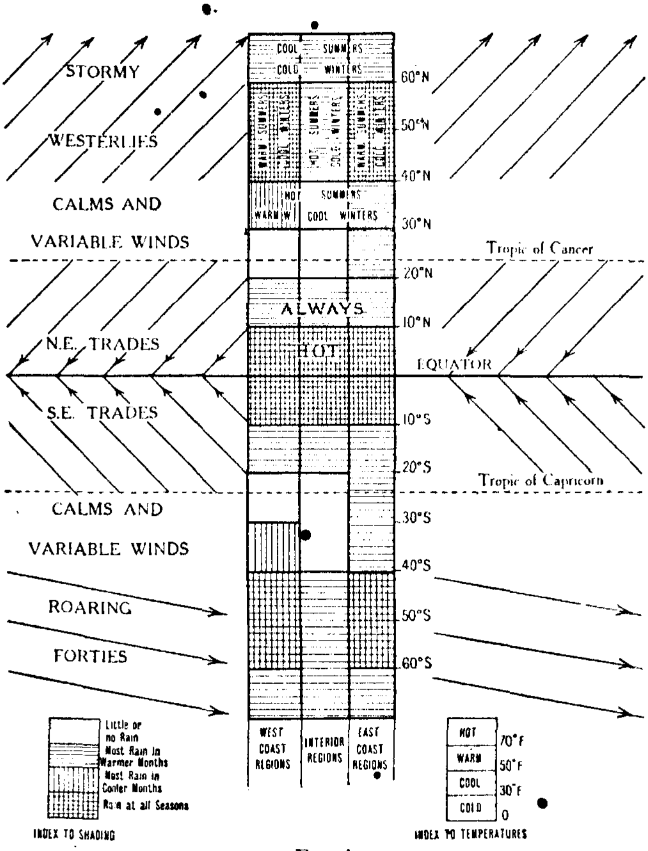


Fig. 4.

eastern parts of Canada and the British Isles is cyclonic in origin. These cyclones alternate with

"anti-cyclones," or high-pressure systems, from which the air flows downwards and outwards, resulting in clear, dry weather.

The fierce whirling storms known as hurricanes, which do so much damage in the West Indies, are really cyclones of small area but very steep barometric gradient occurring in the Trade Wind belt.

The west-wind belts, like the Trade Winds, move north and south "with the sun." This results in countries that lie roughly between the latitudes of 30° and 40° experiencing the Trade Winds in summer and the Westerlies in winter. It is obvious that such countries, if they lie on the east side of a continent, will receive most of their rain in summer from the Trade Wind; while, if they be on the west side, they will receive winter rains from the Westerlies. Natal and the southern coasts of New South Wales are of the former type; while Gibraltar, Malta, the Cape Town region of South Africa, and the Perth and Adelaide districts of Australia are of the latter.

3. *Monsoons*, or seasonal winds, are experienced on the tropical shores of the larger land masses, and are typical of India and North Australia. The intense heating of the land mass in summer causes the air above it to become hot and light, and the air from over the relatively cooler seas is drawn towards the region of high temperature and low pressure. In the winter conditions are reversed, and the cold heavy air over the land moves towards the warmer sea. Thus monsoon lands have a hot, wet summer and a cool, dry winter. The winter monsoon is usually the normal Trade Wind of the region, and the summer monsoon its reverse. At the time of the "change of the monsoon" fierce and destructive cyclones are frequent.

(*e*) *The position of mountain chains* has important climatic effects. If they lie across the direction of prevailing winds, as, for example, the Rockies and parallel ranges of British Columbia, the windward

side will receive abundant rainfall; but under the lee of the mountains will be a dry area dependent for its waters on rivers fed by the rainfall and melting snows of the higher levels. The dried wind, however, is usually warmed by compression in its descent on the lee side, and, as is the case with the "chinook" of Alberta, exercises a beneficent influence in keeping pastures free from snow in winter (see p. 248).

If a range runs from east to west it makes a distinct climatic barrier, by preventing the warming influence of winds from the equatorial side, or the cooling influence of winds from polar regions, from reaching the country on the opposite side. The Himalayas form a striking example of this, and the absence of such a barrier in Canada often causes unpleasantly great and sudden changes of temperature in the interior, due to the wind veering from a southerly to a northerly point.

(*f*) *Ocean currents* have a considerable effect in modifying the climate of the shores by which they flow. They are set in motion by the difference in temperature between the waters of equatorial and polar regions, by regular winds and by the rotation of the earth. In both the Atlantic and Pacific Oceans a current flows westward along the Equator, driven by the Trade Winds. Meeting the continents, this equatorial current branches to north and south, and flows along the eastern shores until it is taken up by the westerly winds and blown once more across the ocean in higher latitudes, thus transferring to these cooler seas some of the warmth acquired in tropical regions. In the latter stages of its course it loses the distinguishing features of a current, becoming simply a wide and ill-defined drift of warmer surface water. Such is the *North Atlantic Drift*, which is the end of the North Equatorial Current and the Gulf Stream, which are such distinct features of the North Atlantic Ocean. To its influence, and that of the prevalent winds that blow across it

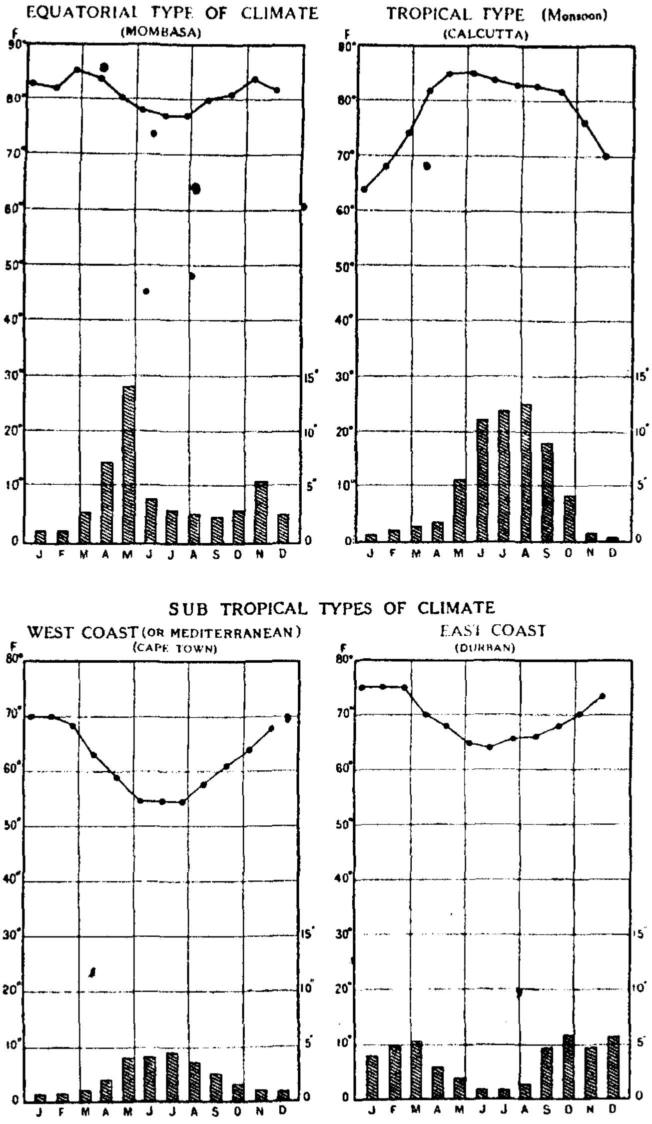
towards the British shores, do we owe our open ports in winter, while the Gulf of St. Lawrence, in similar latitudes, is frozen up under the influence of the cold Labrador current that sweeps down the eastern shores of North America from the Arctic Ocean. The effect of this cold current is also accentuated by the prevalent westerly winds, which, blowing off shore, tend to carry away the warmer surface waters, allowing the colder waters to well up from below.

In the Great Southern Ocean there is a steady eastward drift under the influence of the Roaring Forties, but cold currents from the Antarctic make themselves felt along the west coasts of the three southern continents, especially where the easterly Trade Winds are blowing off shore. The east coasts, on the other hand, are washed by the southern branches of the warm equatorial currents, so that the coasts of Natal and New South Wales are warmer, as well as wetter, than those of Cape Colony and Western Australia in the same latitude. (Note *diagrams*, p. 23.)

Natural Regions of the Empire

With the climatic considerations noted above, it is possible to divide the British Empire into a number of natural regions, over each of which the climate, and therefore the productions and, to a certain extent, various forms of human activity, exhibit a considerable degree of uniformity, although they may exist in widely separated parts of the world.

A. *Equatorial Lowlands.* These are the regions of greatest heat and rainfall, having rain at all seasons, with two well-marked maximum periods, and an insignificant range of temperature throughout the year. They are usually covered with thick forests containing such valuable timber trees as mahogany and ebony, and also rubber and the oil and coconut



Mean monthly temperature and rainfall for places typical of some of the more important Natural Regions

Fig 5.

palms. Bananas and many other fruits and spices also grow, and the elephant is hunted for its ivory. Such regions are inhabited by dark-skinned natives, whose wants are few and easily supplied, so that they become indolent; and the climate being unhealthy for Europeans, there is little development. But the natives are gradually becoming accustomed to gather such forest products as have commercial value for sale to white traders, and with increase of scientific knowledge regarding various tropical diseases greater progress will be made.

The principal parts of the Empire of this type are the various possessions in the Malay Peninsula and Islands, the coastal regions of British East and West Africa, and British Guiana.

B. *Tropical Lands.* These are marked by high temperature throughout the year, and a distinctly wet season, due either to a monsoon or to the swing of the belt of equatorial calms, and occurring at the time of greatest heat. The hotter and wetter portions resemble the previous type, and are well forested with teak and bamboo. The cooler and drier portions are mainly grass lands with clumps of trees, especially along the watercourses, this park-like country being known as savanna. This kind of country is usually inhabited by a higher type of native, who practises agriculture and keeps herds of cattle. The summer rainfall suits the growth of sugar-cane, rice, cocoa and bananas in the lowlands, and tea, coffee, and cinchona on the hill slopes; while maize, millet and cotton are also generally grown. Wheat can be grown as a winter crop, *i. e.* planted at the end of the summer rains, and ripened off in the hot, dry winter. The savannas in the thinly peopled regions support herds of wild grass-eating animals and beasts of prey, which provide sport for the big-game hunter; but the higher and more healthy parts are now being taken up as cattle or sheep runs by British farmers. The chief British possessions

of this type are India, the Egyptian Sudan, Rhodesia, Northern Australia, and the West Indies.

C. *Subtropical Lands.* These regions have a hot summer and warm or mild winter without frost, except in the higher parts. They can be conveniently subdivided into east coast, west coast, and interior regions.

1. *The east-coast type* get most of their rain in summer from the Trade Winds, and approximate in character to Regions B—maize, cotton and sugar-cane being grown, and also trees useful for timber. Natal and most of New South Wales are of this type, and are quite suitable for European settlement.

2. *The west-coast, or Mediterranean type,* receive most of their rain in the winter months from the westerly winds, and the summer is hot and droughty. Now this climate is admirably suited to the growth of wheat, which requires a hot, dry ripening season, and to such fruits as the grape, olive, fig and orange, whose plants protect themselves from the heat and drought by having either small tough leaves to resist the sun, or long roots which can penetrate to moister layers of earth. Various nuts are also grown, and the mulberry is cultivated to feed silkworms. Such crops as cotton and rice can only be grown under irrigation, as they require heat and moisture together. Pasture is too poor for cattle and horses, but goats and sheep are kept. The largest British areas of this type lie around Cape Town in South Africa, and Perth, Adelaide and Melbourne in Australia. Cyprus, Malta and Gibraltar are also of this type, and all are well peopled by Europeans.

3. *The interior subtropical regions* suffer from lack of rain, and are only very poor grass or scrub lands merging into deserts. They can be used to pasture sheep, goats and ostriches, but are not suitable for cattle. Agriculture is only possible under irrigation from rivers or artesian wells. Such are the karroos and veldt of South Africa and the Riverina

District in Australia, which merge into the Kalahari and Australian deserts respectively.

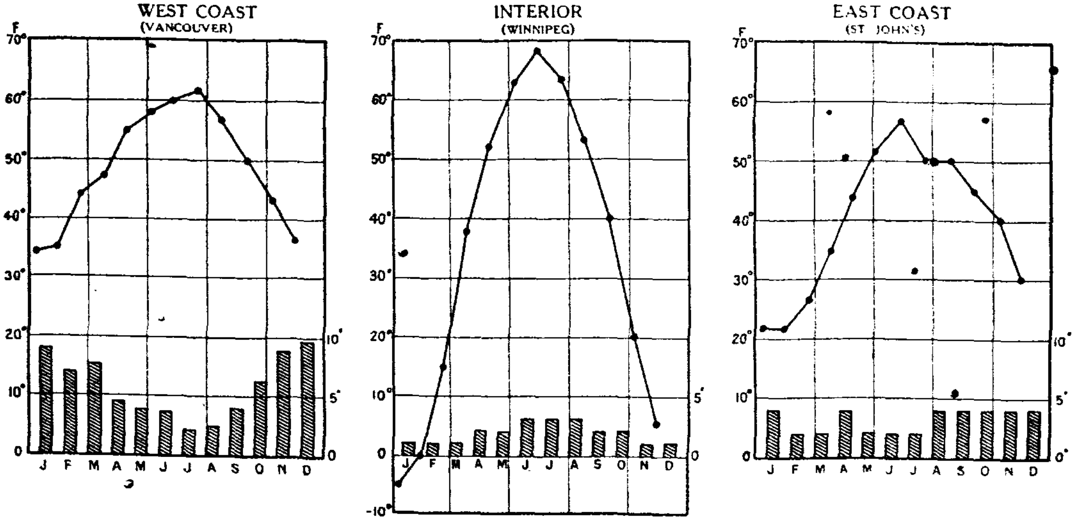
D. *The Temperate Regions* have warm or hot summers and cool or cold winters, according to their distance from the sea. They, too, can be conveniently subdivided, as the Regions C.

1. *The east-coast regions* have a fairly extreme climate due to the prevailing westerly winds blowing off the land, which is hotter in summer and cooler in winter than the ocean. The extreme winters are accentuated by the cold current which comes down from the polar regions. Cyclones draw in rain-bearing winds from the sea, and the rainfall is fairly heavy and well distributed throughout the year, with heavy snowfalls in winter, when all rivers and lakes are frozen. The areas are naturally covered with forest, the trees being deciduous, like oak, beech, elm and maple in the warmer, and coniferous in the colder parts. These provide valuable timber, resin and wood pulp, and in the clearings agriculture and cattle-rearing are carried on—oats, barley and roots being the principal crops. The eastern states of Canada are of this type.

2. *The west-coast regions,* receiving the westerly winds from the sea, have a mild, equable climate, and the rivers are never frozen. Where the land is high, there is copious rainfall at all seasons, and such a climate produces some of the finest timber trees in the world, notably the Douglas and Kauri Pines. In the sheltered valleys, where the rainfall is less, the mild climate is admirably suited for the growth of pears, plums and peaches. Lumbering and fruit-growing are two of the principal industries of British Columbia, the western side of the South Island of New Zealand and Tasmania, which are of this type. The British Isles are also of this type, but much of the forest has been cleared for cultivation and building purposes.

3. *The interior regions* have great extremes of

TEMPERATE TYPES OF CLIMATE



Mean monthly temperature and rainfall for places typical of some of the more important Natural Regions.

FIG. 6.

summer heat and winter cold owing to their distance from the sea, and only a light rainfall for the same reason. Most of the rain falls in the summer months, when évaporation is greatest from the inland waters, and when the winds are drawn in most strongly from the seas. The rainfall is insufficient for the growth of trees, except in the cooler regions, where the forests of east and west are linked up by a broad belt of coniferous forest, which is the home of many fur-bearing animals. The extensive grass lands or treeless prairies are used for cattle-rearing on a large scale, but where rainfall is sufficient and the soil is fertile they are being gradually brought under the plough for the growth of wheat and other cereals. The prairie provinces of Canada are the best and largest examples of this type, and the relatively dry Canterbury Plains under the lee of the New Zealand Alps may be compared with them, but their climate is not nearly so extreme, for obvious reasons.

These temperate regions also contain abundance of minerals, and as their climate is not too hot to enervate or too cold to discourage, it is in them that man has reached his highest stage of development.

E. *The Tundra*, or Arctic shoreland, is of little economic importance, being a frozen waste in the long dark winter, and a swamp in summer. Fish, wild-fowl, and the flesh of the polar bear are almost the only food of the Esquimo, who live in skin tents in summer and ice huts in winter.

CHAPTER IV

THE MATERIAL RESOURCES OF THE EMPIRE

Could the Empire become self-supporting?

As it has been shown that the Empire embraces regions of every type of climate and production, it becomes of interest to consider to what extent the various parts of the Empire are able to supply each other with the necessities of life under modern conditions, and whether, indeed, the Empire could, if necessary, be self-supporting and independent of the other countries of the world. It is difficult to give a very definite answer to the question, for several reasons. In the first place, the Great War has shown that countries which had for a long time been regarded as very largely dependent upon foreign commerce, were able with a greater or lesser degree of inconvenience to support themselves when this commerce had been either entirely destroyed or reduced to insignificant proportions. Then, also, while it is possible for the various countries of the Empire to obtain supplies of certain materials more cheaply from " foreign " countries, because of greater proximity or facility of production, the resources of those parts of the Empire which might, under greater pressure, produce these commodities remain quite or almost undeveloped. To take but one example, there is no doubt that, if it were not possible to obtain from the United States and Argentina such large, cheap and excellent supplies of grain and meat, then the farmers of the United Kingdom might find it quite possible to produce these articles in much larger quantities than at present. And, finally, no definite and valuable statistics yet seem available to show the further possibilities of the different parts of the Empire in the production of the various supplies of foodstuffs and raw materials.

But, taking things as they are, two tables in the

Statistical Abstract of the Board of Trade for 1913 afford some interesting comparisons.

The first shows the total value of the imports of various staple articles into all parts of the Empire from foreign countries, while the other shows the total exports of the same kinds of articles from all parts of the Empire to foreign countries. These are, of course, quite independent of the exchanges of these goods that have been carried on among the various units of the Empire. Just a few of the larger and more important items will be considered. (Appendix D, p. 363.)

1. *Wheat and Flour.* Apart from home-grown supplies in the various parts of the Empire, it is seen that some 30 million pounds' worth of these articles were obtained from foreign countries, the mother country being the recipient of no less than 26. On the other hand, various parts of the Empire were able to supply foreign countries with 11 million pounds' worth. So it is clear that, had "foreign" trade in wheat and flour been suspended for this particular year, there would apparently have been a shortage in the Empire of some 19 million pounds' worth. As, however, import values always exceed export values of the same article, on account of cost of freight and insurance of the cargo, the difference would not have been quite so great as appears at first sight.

Other statistics show that in recent years a fifth of all the wheat grown in the world is produced in the British Empire, and, with the further development of the Canadian North West, and of the wheat lands of Australia (see pp. 249, 314), it should be possible to increase this proportion considerably, and thus make the Empire independent of outside supplies.[1]

2. *Meat.* Here the apparent shortage is no less than 41 million pounds' worth, almost entirely de-

[1] Figures for 1919–1920 show that while U.K. will need to import 5,700,000 tons of wheat, Canada has an exportable surplus of 3,290,000 tons, and Australia and New Zealand 2,700,000 tons.

manded by the mother country. As the tendency, especially in Canada and Australia, seems to be gradually to bring more and more grazing land under the plough, this shortage is likely to increase rather than diminish.

3. *Sugar.* The table brings out the enormous extent to which the Empire had become dependent upon foreign countries for its supplies of this important foodstuff—a fact which was brought home to all consumers by the great and sudden increase in price at the commencement of the Great War. For although at one time the British West Indies were the greatest source of supply of sugar, not only for Great Britain but for all the countries of Western Europe, the Napoleonic wars so interfered with this trade that the countries of the Continent were forced to find a substitute; and the success of the beet-sugar industry, once established, became, under the encouragement of the various Governments, so great, that finally the old West Indian industry was almost killed by its competition. In 1913 Great Britain was buying two-thirds of all its supplies from Germany and Austria, and most of the rest from Holland, France and Belgium, the proportion of cane-sugar obtained from the West Indies and elsewhere being almost insignificant. The war has given a stimulus to the growth of sugar-cane in all tropical lowland countries of the Empire, and may revive the West Indian trade and establish a flourishing industry in Mauritius, Queensland and elsewhere; so that, ultimately, the Empire may be able to rely upon itself for all it needs of this commodity.[1]

4. *Cotton.* In the matter of this important fibre it will be seen that the Empire is far from self-supporting, although, owing to the fact that the United Kingdom manufactures cotton goods so largely for foreign countries, the demand for raw cotton is, of

[1] Figures for 1919–1920 show that countries of the Empire produced a third of the world's total crop of cane sugar. One half of the British total was produced and consumed in India alone.

course, far in excess of the actual needs of the people of the Empire. The figures, too, would be considerably modified had Egypt been regarded as a part of the Empire. This would have reduced the total imports from foreign countries by about 20 million pounds' worth, and raised the total exports to foreign countries by about 15, so that the apparent shortage almost disappears. This is, however, a little misleading, for most of the cotton exported from parts of the British Empire other than Egypt is of a type that does not find favour with British manufacturers, who specialise in finer "counts." About three-quarters of all the cotton used in the United Kingdom consists of the finer varieties from the United States. It is, however, believed that many parts of the Empire which have long summers free from frost, and with sufficient but not excessive rainfall, could produce equally fine cotton, and Government assistance has been given to encourage experiments in the Sudan, Uganda, Northern Rhodesia, Nigeria and elsewhere.

5. *Timber.* Here there is apparently a very considerable lack, and again the mother country makes the largest demands, accounting for practically the whole of the difference between the foreign imports and exports. But, in this case, it is purely a matter of convenience, for the large and magnificent forests of Canada alone are as large and contain as many varieties of trees as those of the parts of Norway and Sweden and Russia, from which the bulk of the timber used in Great Britain for building purposes, pit-props, etc., is obtained. Then, also, there are vast virgin forests of somewhat similar type in Australia and New Zealand, and it has been authoritatively stated that much valuable afforestation might be carried out in parts of our own country at present lying waste. But the proximity and consequent cheapness of large European supplies has prevented these sources from being fully developed. This,

however, is another instance where temporary shortage due to the war may give the necessary stimulus.

6. *Oil.* This includes such vegetable oils as olive, cotton-seed, coconut and palm oil, used variously for food, lubricating, manufacture of soap, etc. Of such oils the British Empire supplies an abundance; but the oils in greatest demand are the various products obtained from the distillation of petroleum, including paraffin, petrol, benzene, etc., which are of the utmost importance, with the recent rapid development of the various types and uses of internal combustion engines for motor traction, aircraft and oil-driven ships. Supplies of petroleum within the Empire are unfortunately, as far as is known at present, both few and small, contributing only two per cent. of the world's total output, the richest wells being in Burma, and considerable deposits in south-west Ontario. There are indications of further possibilities in both eastern and western Canada and in New South Wales; but it would seem that for some years we shall be dependent upon the United States and Russia for the bulk of our supplies.

But the tables show that although in several important items the British Empire is heavily indebted to foreign countries, there are also some in which she has a considerable balance on the right side. First and foremost stands *coal.* The huge surplus of this commodity is mainly due to the enormous deposits of the mother country; for while India, Australia, New Zealand and South Africa have just about enough for their own needs with a little to spare, Canada at present only mines about half the quantity she consumes. It is the mother country, too, that has the *surplus of manufactured goods* of the various kinds shown in the table, and it is well that this should be so; for we have seen that where there is a conspicuous shortage of any foodstuff, or raw material, it is due to the great demands of the mother country. And it is only just so long as the inhabitants

of Great Britain, aided by their supplies of coal, are able to keep up this surplus output of manufactured articles, that a corner of the Empire which occupies less than a hundredth part of the whole area will be able to support more than a tenth of the total population.

But even this prospect is by no means alarming; for, if man's ingenuity is not able to overcome the difficulty that will be raised by the exhaustion of the coal supplies, the economic pressure which will cause increasing numbers to seek a means of livelihood in other parts of the Empire may prove a blessing in disguise. For in them are still to be found vast unpeopled tracts of territory, with untold resources only needing well-organised labour to develop them, and offering to millions a much greater freedom than is to be found in the overcrowded cities of the homeland. Ease and speed of communication, and the march of recent events, are all tending to remove old prejudices and to make the Empire's citizens "think imperially." So that it can be confidently anticipated that, if wisely directed, the national and imperial spirit that has already achieved so much will never find impossible the solution of the problem of how to make a quarter of the world's surface support in comfort a quarter of the world's people.

CHAPTER V

PEOPLES OF THE EMPIRE

Races—Occupations—Concentration—Government.

Just as there are to be found within the Empire plants and animals of every description, so are there also human beings of every shade of colour, language and religion, and every grade of culture; so that the subjects of the King are typical of all the peoples of the world.

RACES. A fairly convenient classification of the various peoples of the Empire can be made on the basis of skin colour, although in this matter, as in any other, it is difficult and unnecessary to draw hard-and-fast lines of distinction, on account of the intermingling that has taken place in many parts.

1. *The White Race*, variously called Caucasian or Indo-European, on account of its supposed place of origin or area of distribution, is distinguished by relatively tall stature, fine features, fair complexion, wavy hair, and mental and physical ability and activity. It comprises the natives of the British Isles and their direct descendants in the Colonies, two-thirds of the people of India, mainly those living to the north and west, and the Egyptians. The Maoris of New Zealand and inhabitants of the Polynesian Islands of the Pacific curiously show some relation to this race.

2. *The Yellow Race*, sometimes called Mongolian, is below average height and distinguished by broad skull, prominent cheek-bones, small nose, thin lips, straight black hair, oblique dark eyes, yellow skin, and considerable mental ability—sometimes masked by a sluggish temperament and lack of enterprise. The chief representatives of this race within the Empire are the Burmese and other inhabitants of North-East India, who have expanded from the original home of the race beyond the Himalaya.

3. *The Black Race* is distinguished by considerable stature, long skull, projecting jaws, broad flat nose, thick lips, round eyes, very dark brown or black skin, and short woolly hair. They are in the main childish, unintellectual and superstitious. Such are most of the natives of the Sudan, Nigeria and other West African Colonies, Uganda, British East Africa and South Africa.

4. *The Brown Race*. These are somewhat akin to the Black Race, but are not so tall and usually not

so dark in colour, with thinner lips, straighter noses, and not such woolly hair. If anything, they are more noisy and savage than the negroes. They inhabit the Malay Peninsula and Islands, the unsettled parts of Australia, and the Melanesian Islands of the Pacific. The Dravidians of Southern India and Veddas of Ceylon are perhaps of this race.

5. *The Red Race.* These natives of the American continent are distinguished by medium stature, prominent cheek-bones and slightly projecting jaws, large straight nose, straight black hair, and copper-coloured complexion. They are fairly intelligent, but never reached a high state of culture, and are now decreasing in numbers. The name "Indian," by which they are usually known, is a misnomer due to the original error of Columbus in his early discovery. The Eskimo of Northern Canada, and the inhabitants of the "Indian Reserves" of the Dominion, are the chief representatives of this race within the Empire.

Occupations. A further interesting classification of the peoples of the Empire may be based upon the main types of industry in which they are engaged, and which can be shown to be largely based upon the geographical conditions under which they live. This will be more fully considered in the chapters dealing with the separate units of the Empire.

The ultimate aim of all human industry, whether applied by single isolated units or by large well-organised communities, is the provision of the necessary food, clothing and shelter to keep the body in health; and highest human development has taken place where this can be achieved not with a minimum amount of effort, as in the case of the tropical islander, or with a maximum, as in the case of the Eskimo, but where the necessary labour leaves time for leisure sufficient for man to cultivate the higher side of his nature, but insufficient for him to cultivate habits of luxury and indolence. In the most primitive forms

of human society each unit secures its own food, makes its own clothes, and builds its own house; but the gradual development of family, tribal and national organisation tends to a specialisation in each of these industries, or branches of them, by certain individuals, for the benefit of the whole community. This idea seems capable of further development in the case of an empire consisting of a number of nations, in which each unit will produce for the common good those products for which its geographical conditions make it most suited; and, so long as the interchange of these productions can be carried on unhampered, it would seem to be along these lines that the Imperial idea should find its fullest and most useful development. The success of such an experiment, worked out on the large scale afforded by the scope of the British Empire, should be a large and important factor in bringing about that realisation of the value of the interdependence of all the countries and empires of the world upon one another, which shall make, in the long run, for universal peace.

The various types of human industry fall into one of four classes, being concerned with the collecting, increasing, elaborating, or distributing, of the natural produce of the world. Under the first heading may be noted the *gathering* of the various wild fruits, gums and other vegetable products of the forests, and even the cutting down of the trees themselves for fuel or building purposes. Then, also, there is the *hunting* of animals to provide food or clothing, or both, for the hunters, and of a similar nature is the catching of fish in rivers, streams, lakes or the sea; while *mining* is simply the collecting of other materials, mainly useful for fuel or building purposes, from the rocks of the earth's surface. The various branches of these industries are carried on by all races from the lowest to the highest in the scale of civilisation; but whereas the South Sea Islander can eat his bananas or his coconuts uncooked, and needs neither clothing

nor dwelling, the British miner is dependent upon the industries of many others, whom he serves or rules, for the necessities of his daily life.

But in most parts of the world man has found that by his skill and care he is able in some directions to increase the natural productions of the earth to his own advantage. Thus arise such industries as *agriculture* and the *domesticating and breeding of animals*, which give him much larger, better and more certain supplies of food and clothing than he could be assured of by his food-gathering or hunting expeditions. Irrigation, such as practised in Egypt, India, Australia and Alberta, scientific farming, by crop rotation, breeding new varieties of wheat to resist hard natural conditions, and the use of artificial manures, etc., and afforestation of suitable areas are all examples of this type of industry.

Of the third type of industry—*the elaboration of natural products*—may be considered the preparation of foodstuffs, ranging from the making of the Hindu's chapati to the making of tabloid foods; the manufacture of clothing, from the beaten bark-cloth of Fiji to the finest products of Lancashire; building operations, from the making of the log cabin of the Canadian lumberer to the laying out of the new Commonwealth capital; and shipbuilding, from the Papuan "dug-out" canoe, fashioned from a tree-trunk, to the gigantic liners of the Clyde.

And, finally, many find employment in industries concerned with *transporting* the surplus of one district or country to another. Such are the native carrier of Nigeria and the Egyptian camel-driver, no less than the British railwayman or sailor; and those employed in banking, insurance and many other official capacities are also dependent upon these industries.

The *density of population* in the various countries of the Empire is closely related to the industries carried on. For it is obvious that a country where

agriculture is largely practised will be capable of supporting more people than one in which man depends entirely on the gifts of nature without making any effort to supplement them. And recent years have shown that the produce of mine and factory is capable of purchasing such large supplies of food, that countries in which mining and manufacturing can be carried on on a large scale tend to become still more densely peopled; while the nature of the work concentrates these large populations into extremely small areas surrounding the mines and factories.

Thus, neglecting the peculiar cases of Gibraltar, Malta, Hong Kong and Aden, which have an abnormal density of population, due to their garrisons, it is noted that the most densely peopled portions of the Empire are those where agriculture has been practised for many years in one form or another, or where there is considerable manufacturing activity. Thus the fertile island of Barbadoes supports over 1000, the Straits Settlements nearly 500, the mother country nearly 400, and India over 200 persons on each square mile of territory, and in the parts where there is considerable manufacturing carried on these averages are greatly exceeded; for example, in Lancashire the density exceeds 1000 and in Bengal 500 per square mile.

Canada and Australia, with vast agricultural and mineral resources, but being till recent years the homes of nomadic hunters, have still less than two people to each square mile of territory, and although the barren lands and deserts of these colonies can never become thickly peopled, it is obvious that these units of the Empire can and will support much greater populations in the future. Concentration of population at certain points, leading to the *growth of large towns or cities* is mainly determined by the productivity of the immediate neighbourhood and facility of communication with other parts of the country and the

world at large. Thus, points of convergence of natural or artificial land and water routes, such as

RELATIVE AREA AND POPULATION OF PARTS OF THE EMPIRE

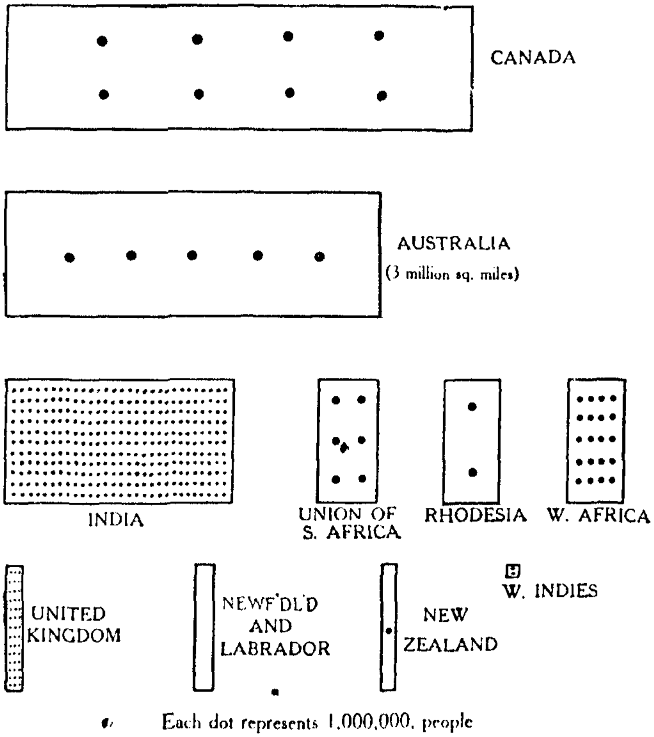


FIG. 7.

mountain passes, caravan routes, roads, railways, sea routes, rivers, lakes and canals; or points where progress in a given direction or by a particular means

of transport is arrested by natural or artificial barriers requiring human activity to overcome them, such as the limit of navigation for various types of craft on a river, a waterfall, a pronounced bend in a river, or the break of gauge of a railway at a political frontier, are all points at which towns spring up. Upon the amount and importance of the traffic passing along these routes, and the number of routes that converge, depends the size of the town. The determination of the sites of the chief cities of the Empire by such factors is considered in subsequent chapters.

Government of the Empire

The keynote of the successful government of the British Empire, which is perhaps the greatest achievement of our race, is adaptability, and the only point common to the government of all parts of the Empire is the supreme authority of the British Crown, which, like other great forces, is more, rather than less, effective because it is unobtrusive. As far as the legislation and administration of the various parts of the Dominions Overseas are concerned, they may be conveniently divided into *Self-governing Colonies* and *Crown Colonies*.

The former include the Dominion of Canada, Newfoundland, the Commonwealth of Australia, the Dominion of New Zealand, and the Union of South Africa. These are all, with possible exception in the last case, white men's lands, that is, places where climate and possible modes of life are quite suited to settlers from the mother country, and where there is only a comparatively small native population. Consequently, the colonists may be left to work out their future in their own way, and the Government is in each case modelled on that of the mother country, consisting of two Houses of Parliament and a Governor appointed by and representing the Crown, which, as in the mother country, has the right of veto over the

Acts of the Legislature. So great is the freedom possessed by these colonies that, when it seems in their interests to do so, they may, and have been allowed to, pass Acts excluding other British subjects from entering them, and imposing heavy protective duties on goods from the mother country in order to give a start to their own manufacturing industries. The return for this, which has been sometimes regarded as more than magnanimous conduct on the part of the United Kingdom, has been seen in the splendid rally of the colonies to the mother country in her time of need.

The Crown Colonies are those portions of the Empire where, owing to unsuitability of climatic conditions, or an already large native population, or both, no large number of European settlers could ever find a permanent home. In these colonies, a few white men by their superior ability and enterprise enable the natives to take part in international trade, and to develop the resources of their country to that end. The work has usually been initiated by a purely commercial company such as the East India Company, or the British South Africa Company, but to prevent abuses has eventually been taken under the control of the British Government. This control is exercised by a Governor appointed by the Crown, and subordinate to the Colonial Secretary, who is a British Cabinet Minister. In some cases, as in the naval and military posts of Gibraltar, St. Helena and Labuan, all powers are vested in the Governor; in others the governor is assisted by legislative and executive councils nominated by the Crown, as, for example, in the case of Ceylon, the Falkland Isles, and the Straits Settlements; while for a third group, including most of the West Indian islands, Malta and Mauritius, the Governor and Executive Council are appointed by the Crown, but the laws are made by a Legislative Council, which is wholly or partly elected by the inhabitants; the

tendency being to grant more and more power to the natives as they become educated to use it, so that in time the Crown Colonies may even come to a condition of full self-government.

India is governed somewhat similarly to the third type of Crown Colony; but it is so large and important that the India Office, a special department of the British Government controlled by the Secretary of State for India, has charge of its affairs in England (see p. 155).

Besides the Crown Colonies there are certain recognised *British Protectorates*, such as Uganda and Bechuanaland, where the natives are ruled by their own chiefs, but where foreign relations are controlled and British trading enterprises protected by a representative of the Crown. These protectorates tend in time to become Crown Colonies, as in the cases of Nigeria and British East Africa.

Several of the problems of government, which are mainly political although influenced by geographical considerations, will be discussed in connection with the various parts of the Empire in which they occur.

CHAPTER VI

LINKS OF EMPIRE

Coaling Stations—Cable and Wireless Stations—Internal Communications.

WHETHER the Empire is to remain a loosely linked series of independent units each working out its own destiny in its own way, and only held together by a common sentiment, or whether it is advisable or possible for a scheme of closer political and commercial Imperial unity to be devised is undoubtedly the great

question for the future. This, however, is hardly the place to discuss it even did space permit, and here it is only possible to point out the more obvious geographical links upon which any kind of unity is or can be based. In either case the one essential factor is that it should not be possible for the lines of political or commercial communication of the Empire to be cut by a foreign enemy, and it is these lines of communication which will be considered here.

Coaling Stations

The first and most important line is the sea, which links together every part of the British Empire; and to hold this line inviolate means that the Empire must support a fleet of war vessels superior to that of any probable combination of hostile Powers, so that in time of war British merchant ships may be free to come and go whither they please, with a minimum risk of capture or destruction by the enemy. The further development of submarine or air craft may modify old conceptions of the way in which this is to be accomplished, but recent events have shown that the greatest power of commerce destruction still lies with the fast cruiser, which can only be effectively countered by its like in superior numbers, speed and armament.

Now, as such attacks are possible at almost any point of the line, it is essential that the defending fleet should be able to concentrate in sufficient force at any point when desired. In the old days of the sailing ships it was the need of fresh water which hampered the mobility of the fleet, and victualling stations were needed all along the line; while, as a modern coal-driven battleship cannot steam much more than 3000 miles from port without exhausting its supplies of fuel, it is obvious that it is now necessary to have placed all along the great commercial highways a number of bases of supply, which should, if

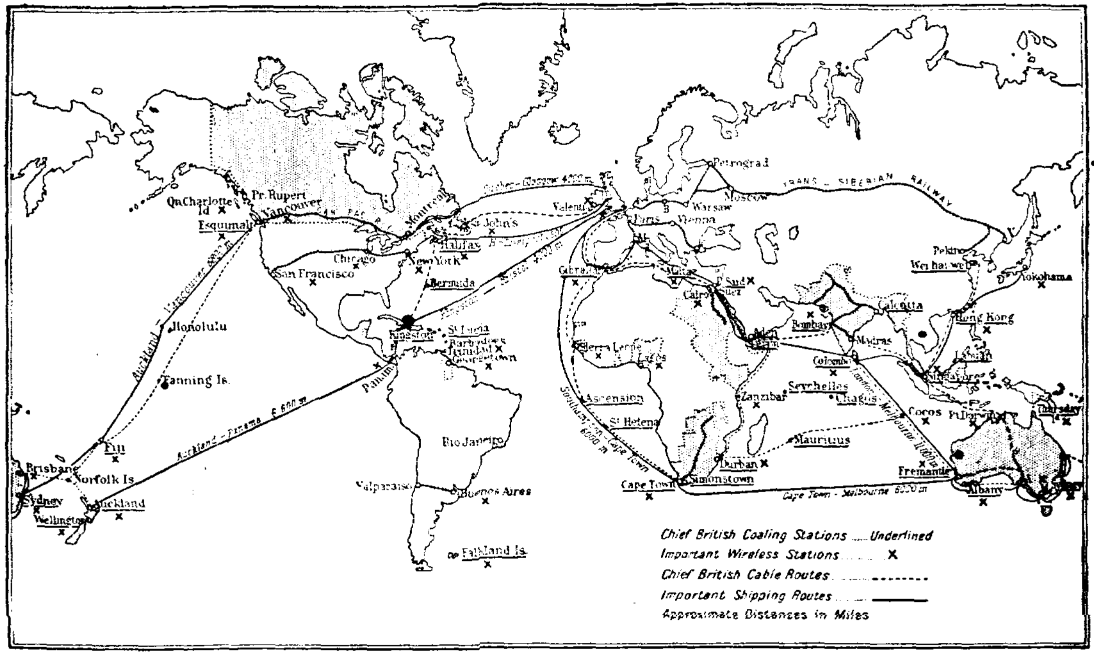

Chief British Coaling Stations ...... Underlined
Important Wireless Stations X
Chief British Cable Routes
Important Shipping Routes
Approximate Distances in Miles
Trans - Siberian Railway
Petrograd
Moscow
Warsaw
Vienna
Paris
Valentia
Gibraltar
Malta
Suez
Cairo
Aden
Bombay
Madras
Calcutta
Colombo
Seychelles
Chagos
Zanzibar
Mauritius
Durban
Simonstown
Cape Town
St Helena
Ascension
Sierra Leone
Lagos
Pekino
Wei hai wei
Yokohama
Hong Kong
Labuan
Singapore
Cocos
Pt. Darwin
Thursday Id
Fremantle
Albany
Cape Town - Melbourne 6000 m
Southampton - Cape Town 6000 m
Qn Charlotte Id
Pr. Rupert
Vancouver
Esquimalt
Montreal
St John's
Halifax
New York
Chicago
San Francisco
Bermuda
Kingston
St Lucia
Barbadoes
Trinidad
Georgetown
Panama
Rio Janeiro
Valparaiso
Buenos Aires
Falkland Is.
Honolulu
Fanning Is.
Fiji
Brisbane
Norfolk Is.
Sydney
Auckland
Wellington
Auckland - Panama 6,600 m

FIG. 8.

possible, be not more than 3000 miles apart. If and when oil replaces coal as the principal source of power, the radius of action will be greatly increased and fewer bases will be needed.

These considerations have led to the acquisition of a large number of *coaling-stations*, some only apparently insignificant islets, where supplies of coal sent out from the mother country can be stored till they are required. At the more important stations fortifications have been erected and garrisoned to protect them from attack. Some have been supplemented by the building of dockyards, or the addition of a floating dock where ships could put in for repairs in time of need.

By far the most important of these naval stations are, of course, in the mother country itself; first, because in its neighbourhood occurs the greatest concentration of shipping, and also because the greatest possible menace to our overseas trade lies in the powerful navies of other Powers across the North Sea. In illustration of the first point, it may be noted that in 1912 the total tonnage of ocean-going ships entering and leaving ports of the United Kingdom amounted to no less that 152 million tons, while the corresponding totals for the whole of India, Canada and Australia were 17, 12 and 10 million tons respectively. The chief naval bases in home waters are at Portsmouth, Devonport, Chatham, Sheerness, Pembroke, Cork, Rosyth, Harwich and Dover. The principal coaling-stations in distant waters may be conveniently grouped as follows, and fuller details concerning each of them will be found elsewhere in the text.

(*a*) *On the Eastern Route*—Gibraltar, Malta, Port Said, Perim, Aden, Bombay, Colombo, Singapore, Labuan, Hong Kong, Wei-hai-wei, Thursday Island, Sydney, Auckland, Melbourne, Fremantle, with Mauritius, Seychelles and Chagos in the Indian Ocean.

(*b*) *On the Atlantic Routes*—Ascension, St. Helena and Simon's Town, the Falkland Isles, St. Lucia, Kingston, Bermuda and Halifax.

(*c*) *In the Pacific*, beside those mentioned under (*a*), Fiji and Esquimalt.

The distance between the last two, and between the Falkland Isles and its nearest neighbour, is in each case greater than that specified as advisable for safety; but as this difficulty will also hamper any probable enemy in these waters, and the commerce passing along these routes is not yet great, the weakness is not emphasised. The possibility of concentrating a fleet at the Falkland Isles in time of need has also been most admirably demonstrated quite recently.

These coaling-stations are, of course, no less useful in times of peace than in times of war in assisting the operations of the hundreds of shipping lines that carry British commerce across all the seas of the world.

Cable and Wireless Stations

Another important means of linking up the countries of the Empire is seen in the many *submarine cables*, which keep the various governments and peoples in touch with one another, facilitate commercial transactions, and also allow of the summoning of help in cases of emergency. The most vulnerable points in these lines of communication are those spots where the cables are landed, and consequently the fortified outposts of Empire mentioned above are used also as cable stations. Others, such as Fanning Island in the Pacific, and Cocos in the Indian Ocean, are protected by units of the Fleet; and it is significant that, after a long career of commerce-destruction in the Indian Ocean, the German cruiser *Emden* was captured and sunk by the Australian cruiser *Sydney* in an attempt to destroy the telegraph station on the latter island. On all important routes the

cables have been duplicated, no less than a dozen separate British lines connecting Canada and Newfoundland with the mother country. One all-British cable route round the world may be noted. Leaving Valentia Island in Dingle Bay, the line crosses the Atlantic and comes ashore in Trinity Bay, Newfoundland. Crossing the island to Placentia Bay, it then goes, via Sydney on Cape Breton Island, to Halifax. From here there is telegraphic communication right across Canada to Vancouver, whence the cable is carried, via Fanning Island, Fiji, and Norfolk Island, to Auckland, Wellington and Sydney. There is then overland connection with Melbourne and Adelaide, whence there is again cable connection with Albany and Perth. The route across the Indian Ocean is via Cocos, Colombo, Madras, Bombay and Aden, and the circuit is completed through Suez, Port Said, Malta, Gibraltar and London. One very important loop goes from Cocos to Mauritius, Durban, Cape Town, St. Helena, Ascension and Sierra Leone; another via Halifax, Bermuda, Kingston, Barbadoes, Trinidad and Georgetown, and a third via Madras to Singapore, with branches northward to Hong Kong and Wei-hai-wei, and southward to Port Darwin and across the great Australian desert to Adelaide. Africa is also crossed by telegraph from the Cape to Alexandria along the line of the projected Cape to Cairo Railway.

Practically all the stations mentioned above and many others have now "wireless" installations, which add to the speed and safety of commercial undertakings, and now rank among the most valuable of the various "links of Empire" (Fig. 8).

Internal Communications

Hardly less important than all these trans-oceanic lines of communication are the various ways (from the native forest trail to the trans-continental rail-

road) by which the terminal points of these routes are linked with their "hinderlands," or the productive regions that lie behind them. For it is the traffic that passes along these ways that first created the need for, and now in turn is assisted by, the various connecting links that have been described above; and in the larger units of the Empire the progress of the country has followed close upon the improvement and extension of the various means of transport and communication. Particular examples will be noted in subsequent chapters, but a few general aspects of the question may be noted here.

In the first place *natural waterways* are of the greatest importance, and the possession of large navigable rivers or lakes is one of the best assets of a country. For these offer a permanent way that needs no keeping in repair, and upon which power can be most economically used for transport. That this is so can be seen by comparing the load a horse is able to pull in a cart with what it can do when attached to a canal barge, and the same is, of course, true whether the power used be derived from coal, oil, or any other source. Goods, too, can be carried more conveniently in great bulk by boats and ships than by waggons and trains; and whether the waterways be the creeks of the Straits Settlements or the tributaries of the Niger, down which the native canoes ply with their tropical produce, or the great lakes of Canada, along which the "whale-back" steamers carry their thousands of tons of grain, they are of the utmost commercial value. Two sets of Canadian figures for 1912 are significant in this respect. Along the 2,700 miles of lake, river and canal navigation were transported 48 million tons of freight, while along the railways, which give more than ten times that length of communication (29,000 miles), the freight carried was only 90 million tons. The value of water communication is emphasised by the way in which *canals* have been constructed to

supplement existing routes, notably in Canada, where the Soo, Welland and Rideau Canals avoid obstructions in the navigation of the Great Lakes (see p. 266), and in the plains of Northern and South-Eastern India. In our own country the canals, built before the time of railways to supplement existing means of communication, have in many places fallen into disuse, owing to competition or purchase by the great railway companies.

Of *land transport* the most primitive is that of *human porterage*. This is only used over long distances, where heavy rainfall, dense forests and scanty white population have prevented the construction of roads or railways, and insect pests make animal transport impossible, as in the tropical parts of Africa and Malaysia, where long lines of porters carry bundles of rubber, cotton, ivory and other produce on their heads for miles along the narrow tracks through the forests down to the nearest waterway. This means of transport is probably more expensive and unsatisfactory than any other, and is only resorted to where no other is available. The first improvement on this method is that of using *pack-animals*. The only animals used to any extent in this way within the British Empire are the yak and the camel. The former, a sort of shaggy ox, is used to carry on the trade between Northern India and Tibet across the high passes of the Himalaya, where the rarity of the atmosphere is fatal to horses or mules. The camel, with its many physical adaptabilities to the heat and drought of the desert, is used in the desert parts of Egypt to trade between oasis and oasis, in the trade between North-West India and Afghanistan, through the Khaibar Pass, and in the dry districts of South and Western Australia. A camel caravan often consists of several hundred beasts, each bearing a load of from three to four hundredweight. The introduction of the *waggon* made it possible for an animal to draw much larger

loads, but its use is only possible on open plains, or where there are well-constructed roads. Of this type of transport the Boer trek-cart, drawn across the veldt by a team of eight to sixteen bullocks, is typical. The possibilities of wheeled traffic were greatly improved by the invention of the macadamised and wood-paved roads, and the great development of the petrol engine for road transport is one of the features of the twentieth century.

But the greatest revolution in transport was undoubtedly the invention of a locomotive engine to draw wheeled traffic along a steel *railway*, and the enormous development that has followed its introduction makes it almost impossible to realise that this means of communication is not yet a century old. The rapidly extending use of this means of transporting people and goods quickly, safely and in large numbers from place to place, has undoubtedly been one of the greatest factors in the development and strengthening of the Empire. This is particularly the case with Canada, which till the opening of the Canadian Pacific Railway in 1886 was regarded by the majority of Englishmen as little more than the home of adventurous backwoodsmen, or the haunt of the Red Indian and the buffalo. But, by making it possible to get the produce of the rich prairies and mines of the interior down to the coast, and thence into the markets of the old world, the railways have attracted the settlers who have made Canada what she is. And in Australia, along the lines originally built from the seaports to the gold mines of the interior, are springing up farms which will probably be a source of much greater and more lasting wealth to the country. Australia, too, now has its trans-continental railroad from east to west, and it may be anticipated that at no very distant date the linking of the railways of Rhodesia and the Sudan will complete the line from the Cape to Cairo.

And along practically every one of these useful rivers, forest tracks, roads and railways, even in the remotest corners of the Empire, runs the electric telegraph and a postal service that keeps the settler in touch with home. So that all these links of Empire are more than links, they are the arteries and nerves upon which its very existence depends.

PART II

EUROPEAN POSSESSIONS

CHAPTER VII

THE BRITISH ISLES

POSITION AND PHYSICAL FEATURES

World Position—The Various Seas—Highlands and Lowlands.

WORLD POSITION. The mother country of the Empire lies between the lines of 50° and 60° north latitude, that is, in that belt of the earth's surface in which history has proved it to be possible for man to make the greatest economic development. For in such regions man can obtain the means of livelihood by a reasonable amount of exertion, unaffected by the enervation of tropical heat or the discouragement of Arctic cold.

The advantage of this position is also enhanced by the very fact of insularity, which not only lessens extremes of summer and winter climate, but also diminishes the chances of hostile interference from other peoples, while not hindering peaceful commercial relations.

A glance at a globe also shows that the British Isles hold a remarkably central position among the great land masses and great commercial countries of the world—an advantage that can hardly be over-estimated by " a nation of shopkeepers," who should be ready to acknowledge that they are largely what they are because of where they are.

The Narrow Seas and the Sea Coasts. The seas that

join us to our friends and separate us from our enemies on the Continent of Europe are nowhere more than four hundred miles in width, *i. e.* a two days' journey by an ordinary cargo boat, and the Strait of Dover is little more than twenty miles across. So that, although they have always afforded a great obstacle to any hostile invasion, they have never prevented either the influx of friendly peoples and new ideas, or our relatively easy access to the scenic beauties, the centres of learning, and the markets of the Continent. These two important factors in our economic development are the great gifts of the Narrow Seas.

Hardly less important than the narrowness of the surrounding seas is, perhaps, their shallowness. An examination of a map indicating sea depths will show that the British Isles rise above a slightly submerged platform thrust out westward from the Continent of Europe, and only descending to the Atlantic abyss some fifty miles to the west of Ireland.

Over this "Continental Shelf" the depth of the sea nowhere exceeds 100 fathoms, the greatest depth of the Strait of Dover is only thirty fathoms (*i. e.* less than half the height of St. Paul's Cathedral), and over the Dogger Bank, an area of some 5000 square miles in the middle of the North Sea, there is never more than twenty fathoms of water.

Two important economic results follow from this shallowness. First, the tidal wave advancing from the Atlantic is piled up around our islands, and the high tide in consequence penetrates far inland up the estuaries of the rivers, carrying shipping with it and helping to clear the channels for navigation. In the second place, shallow waters, especially in cool seas like those around our shores, are the homes of many varieties of valuable fish, which not only supply food for our people, but employ about 100,000 men and boys in their capture, and many more in preparing them for the home markets and for export.

No country has a greater length of coast line in

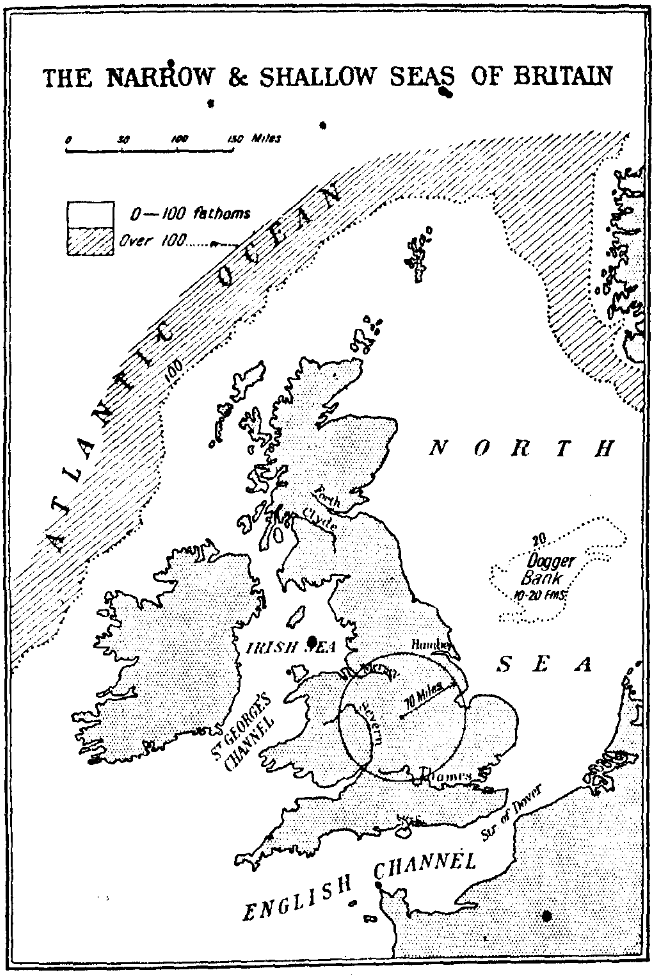


FIG. 9.

proportion to its area than the United Kingdom, and the estuaries of the Thames and the Severn, the

Humber and the Mersey, the Forth and the Clyde, penetrate so far into the country from opposite sides that no person lives more than seventy miles from the sea, and no industrial centre has more than fifty miles to send its products to a seaport, or to fetch its raw materials brought from overseas. Thousands of Britons, therefore, take naturally to seafaring for a living, and three ships out of every seven that sail the seas fly the Red Ensign of the British Merchant Service. These seamen form an enormous and valuable reserve for the Royal Navy in times of need, and to their hardihood and enterprise is due in no small measure the vastness of our widespread Empire.

The *sea-lochs*, or *fiords*, formed by the submergence of old glacier-scooped valleys of Western Scotland, and the *rias*, or "drowned" river estuaries, of South-West Ireland and Wales, form magnificent natural harbours, but the mountainous and unproductive country that lies behind them has hindered their development as commercial ports. Berehaven on Bantry Bay, and Pembroke on Milford Haven are, however, important naval stations. On the river estuaries named in the previous paragraph, as well as on the estuaries of the Tay, Tyne, Wear, Tees and Humber on the east coast, on Southampton Water and the Tamar estuary on the English Channel, and on Dublin Bay and Belfast Lough on the Irish coast, have grown up large commercial seaports based upon their productive and well-peopled "hinderlands."

Highlands and Lowlands. In the British Isles, land rising to a greater height than 1000 feet above sea-level is economically of little or no value, unless the rocks contain valuable minerals or the rushing mountain torrents can be utilised for providing water power. For otherwise the climate at this altitude is too bleak to allow of either successful agriculture or comfortable existence for man or beast; and the height of the mountains is usually

due to the hardness of their rocks, with the consequent result of an absence of good and fertile soil. As the highlands form barriers to communication, easy natural routes across them are of the greatest importance.

No land exceeding this height is to be found on the south side of a straight line drawn from Start Point to Flamborough Head, and it will be found that in every part of this great *English Lowland* some form of economic activity, either pastoral, agricultural, or industrial, is pursued. The rivers, too, that cross it from the higher regions to the north and west, notably the Trent, the Great Ouse and the Thames, are long, slow and navigable, and being linked up by canals form a network of most useful commercial waterways. Roads and railways also cross the plain in every direction.

The Highlands lie in several distinct masses. *The Northern Highlands and Grampians* cover more than half of Scotland, leaving but a narrow coastal plain on the eastern side, and presenting a bold front to the Atlantic. The great natural trench of Glenmore crosses them from sea to sea, and the rivers and lakes of the glen have been connected by the Caledonian Canal, which is, however, only available for small vessels. Although it avoids the dangerous journey through the stormy Pentland Firth, the unproductive nature of its neighbourhood makes it of little economic importance. A mountain stream, tumbling over the Fall of Foyers into the Great Glen, generates electrical power for an aluminium works. Granite is quarried and exported, the red variety chiefly from Peterhead and the grey from Aberdeen. Routes from north to south "across the grain" of the Highlands are difficult. The best known, now followed by the Highland Railway, largely dependent on tourists, is from Inverness through the Monadliath Mountains into Glen Spey, which is followed till the Pass of Drumochter, about a quarter of a mile above

sea-level, gives access to Glen Garry, which the route follows till it enters the "great plain" of Strathmore by the Pass of Killiecrankie and the Tay Valley. The Highlands abound in picturesque fresh-water lochs and mountain streams, but only the lower courses of the longer eastern rivers, where they cross the fertile coastal plain, have any considerable value. The beautiful and once romantic Loch Katrine is now a reservoir of drinking-water for Glasgow.

The Southern Uplands and the Cheviot Hills are famous sheep pastures, and form a natural obstacle to communication between England and Scotland. The battlefields of Berwick, Dunbar and Prestonpans show the ancient importance of the narrow east-coast road between the Uplands and the sea, which is now followed by the North British section of the "East Coast Route to Scotland." The "West Coast Routes," diverging from Carlisle, follow the natural river routes across the Uplands, going to Glasgow either by Nithsdale or by Annandale and Clydesdale, crossing Beattock Summit in the Leadhills at a height of 1000 feet, or to Edinburgh by Liddel Water, the Tweed Valley and Gala Water.

The Central Lowlands of Scotland consist of a "Rift Valley," or trough, some forty miles wide, let down between the Highlands and the Uplands by parallel "faulting," or cracking of the earth's crust. These Lowlands are covered with a fertile soil, have a more congenial climate than the surrounding regions, and above all contain valuable coal measures, which, by the lowering of this region, have been preserved from destructive denudation by the Ancient Ice Sheet and other weathering agencies that have probably removed similar supplies of power from the higher lands. All these advantages, together with the fine navigable estuaries of the Tay, Forth and Clyde and the natural facilities for the construction of roads, canals and railways, have made this the most important economic region of Scotland

and the home of three-quarters of its people. The commercial and strategic value of the deepening of the small ship canal from Grangemouth on the Forth to the shipyards of Clydebank, so that it could accommodate the largest vessels, is being seriously considered.

The only parts of this area over 1000 feet in height are the Campsie Fells, the Ochil, Sidlaw and Pentland Hills, which are masses of volcanic basalt parallel to the boundary faults of the Rift Valley, possibly originating at the same period of the earth's history. Edinburgh and Stirling castles are also built on volcanic crags, another of which forms the Bass Rock in the Firth of Forth. Stirling and Perth guarded the gaps cut across these volcanic hill ridges by the Forth and Tay, which are the links between the Highlands and the Lowlands.

The Pennines and the Cumbrian Mountains, linked by Shap Fell, which is crossed by the London and North-Western Railway at a height of nearly 1000 feet, form the greatest highland mass in England. The flat-topped and infertile northern Pennine moorlands are chiefly used as sheep-walks, but the more picturesque limestone dales of the Peak District, with their mineral springs, have given rise to health and holiday resorts. Dovedale, Buxton and Matlock are well known.

The more rugged mountains and beautiful lakes of the Lake District have made it a famous holiday resort, and there is a great tourist traffic, especially in the summer months. But the rocks also yield slate, lead, zinc and small quantities of plumbago, and Thirlmere is a reservoir of drinking-water for Manchester.

But the most important economic fact connected with this region is that the uplift, or fold, of the earth's crust that produced it, also brought to the surface coal measures that lay buried under layers of more recently deposited rocks. As in Scotland, the coal

measures have been denuded from the higher parts, but on both flanks are extensive coal-fields supporting large and important manufacturing industries, which will be considered later.

The heavy rainfall of this region is carried off to east and west by a large number of streams and rivers, which form useful means of communication in the fertile and productive plains on either side, and whose estuaries have become the sites of great seaports. Two of these rivers, the Aire on the east and Ribble on the west, have carved a natural gap across the Pennines, which is traversed by road, canal and railway, and forms a most valuable link between the thickly peopled coal-fields on either side. Further north the Tyne Gap between the Southern Uplands and the Pennines is also important. Hadrian's Wall followed this route in ancient times, and it is now traversed by the North-Eastern Railway from Newcastle to Carlisle.

Besides these natural routes several railways now cross the Pennines in tunnels, especially in the busy southern region, and a canal connecting Manchester and Huddersfield also passes through the Standedge tunnel, three miles long.

The Welsh Mountains cover most of the Principality, and except as sheep-pastures are of little value. However, slate is quarried in the Snowdon district, and mineral springs associated with fine scenery have led to the establishment of several inland health and holiday resorts, *e.g.* Builth and Llandrindod Wells. The headwaters of the Vyrnwy, tributary of the Severn, have been converted into a reservoir to supply Liverpool with drinking-water, and Birmingham also draws its supplies from the mountains of Central Wales. The Dee, the Severn and the Wye afford easy routes to the fertile English Plain, the castles of Chester, Shrewsbury and Hereford testifying to their importance in ancient times. These same valleys are, however, obstacles to com-

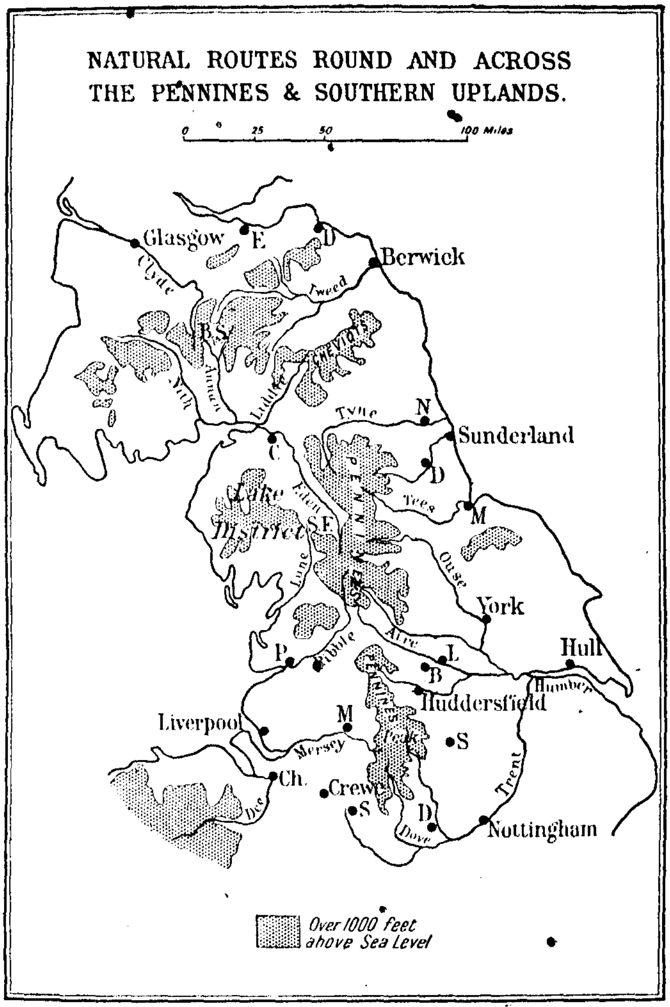

NATURAL ROUTES ROUND AND ACROSS THE PENNINES & SOUTHERN UPLANDS.
0 25 50 100 Miles
Glasgow
E
D
Berwick
Clyde
Tweed
B.S.
Annan
Nith
Liddle
CHEVIOTS
Tyne
N
Sunderland
C
D
Lake District
Eden
Tees
M
S.F.
PENNINES
Ouse
Lune
York
Ribble
Aire
P
L
B
Hull
Humber
Huddersfield
Liverpool
M
Mersey
S
Ch.
Crewe
Peak
Trent
S
D
Dee
Dove
Nottingham
Over 1000 feet above Sea Level

Fig. 10.

munication from north to south, and a cross-country journey by rail from, say, Llandudno to Swansea is very circuitous. Where the mountains approach the sea, as at Llandudno and Aberystwith, seaside resorts have grown up. As in the case of the Pennines, coal measures have been brought to the surface along the mountain flanks, especially in the south, which has in consequence become a thickly peopled industrial region.

Although the valleys mentioned are traversed by railways, the great mail routes for Ireland are confined to the narrow coastal plains by the mountains, the Holyhead route following the northern and the Fishguard route the southern coast.

The Highlands of Devon and Cornwall. These consist of the Old Red Sandstone mass of Exmoor and the granite masses of Dartmoor and Bodmin Moor. All are infertile, but the granite contains veins of copper and tin ore that have been worked from the dawn of British history, and in places has decomposed leaving valuable deposits of kaolin or china clay. The fine scenery where the rugged Exmoor reaches the coast has led to the establishment of holiday resorts such as Ilfracombe, and this same rugged coast produced the most famous of the Elizabethan "sea-dogs." Railway routes traverse the fertile coastal plains and the valleys of the Exe and Tamar that lie at the foot of the moorlands, gathering up the agricultural and dairy produce, and carrying tourists to the holiday resorts of the "Cornish Riviera."

The Mountains of Ireland lie in isolated patches at various points around the great Central Plain, and offer little hindrance to communication. The mountains of Donegal and Connaught are a continuation of the Scottish Highlands, alike in their structure and lack of economic importance. Some marble is quarried in the Connemara district. The basaltic plateau of Antrim is of the same geological age as

the volcanic hills fringing the Central Lowland of Scotland, and the Mourne Mountains continue the line of the Southern Uplands. The Wicklow Mountains correspond with those of North Wales, and are alike famous for their scenery. Granite is quarried. The mountains of Cork and Kerry contain the beautiful lakes of Killarney, and the submerged valleys between the folds make fine harbours. The great mail route from Kingstown to Queenstown passes through the natural gap in the mountains at Mallow.

The arrangement of the mountains sends most of the drainage to the sea across the *Central Plain,* which is in consequence well provided with rivers, lakes, and swamps, facilitating the construction of canals. There are, however, large areas suitable either for pasture or for agriculture.

CHAPTER VIII

THE BRITISH ISLES (*continued*)

CLIMATE

ALTHOUGH English weather is, not without reason, frequently the subject of unfavourable comment both from natives and visitors alike, no Briton can reasonably complain of his country's climate. For, although it may be difficult if not impossible to imagine anything worse than the atmospheric conditions of these islands for certain short periods throughout the year, there are few countries that experience such excellent *average* conditions of temperature and rainfall.

Temperature. Observations extending over at least thirty years go to show that there is no town in the British Isles whose mean temperature for the coldest month (January) falls below the freezing-point, and no place where the average for the hottest month

(July) exceeds 64° F. These results are due to the latitude, the tempering influence of the surrounding ocean, and the prevailing westerly winds, which distribute this oceanic influence over the islands.

The relatively high winter temperature is perhaps economically the more important, for this ensures that all our ports are ice-free and our rivers unfrozen throughout the winter; the occasions when even small inland streams and ponds are frozen for even a week being very rare. Agricultural work, too, is seldom impeded by heavy snowfall or long frosts.

Notice on the map the July isotherm of 60° F. Places south of this line, *i. e.* nearer the Equator, have a mean temperature for this month exceeding 60°, while places to the north are cooler. It will be observed that inland places have a higher average temperature than coastal places in the same latitude in summer, showing clearly the tempering influence of the sea (Fig. 11).

The January isotherm of 40° F., however, is seen to run roughly from north to south, places to the east being cooler than places to the west of this line. This indicates that in winter the warming influence of the surface waters of the Atlantic Ocean, brought towards our shores by the prevailing westerly winds, has a greater effect in determining temperature than the direct warmth of the sun itself, which at this season is shining vertically far south of the Equator.

It will be seen that these two isotherms divide the map into four sections. In the south-eastern, mean winter temperatures are below 40° F., while mean summer temperatures are above 60° F.—that is to say, there is a mean *range* of temperature exceeding 20° F., and this is climatically the most "extreme" part of the British Isles. The most "equable" section is the north-western, where the mean range is less than 20° F. The comparative extremes of temperature of the south-eastern section favour the growth of cereals.

CLIMATE OF THE BRITISH ISLES

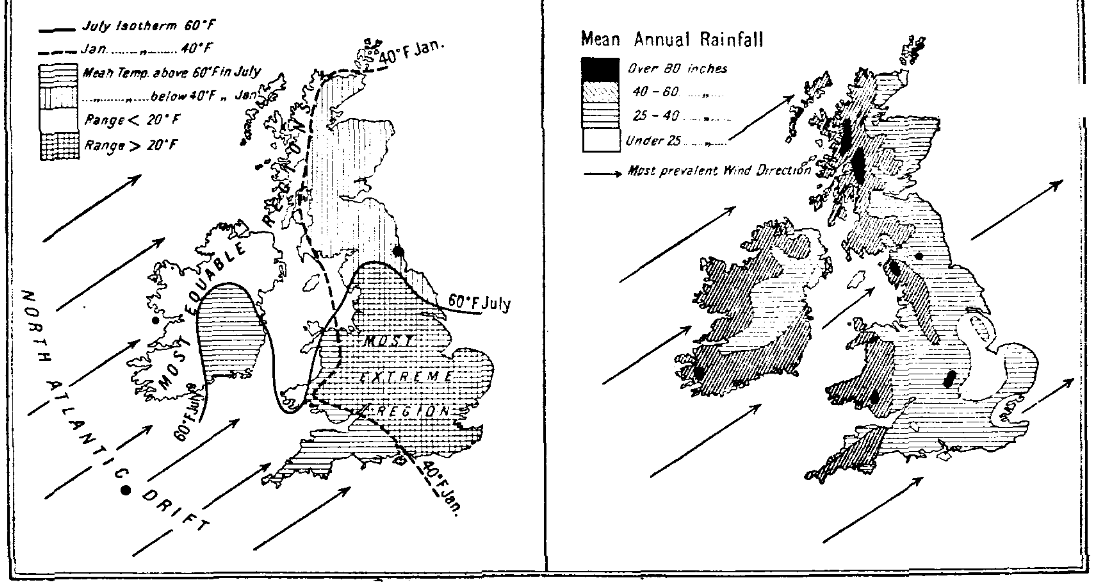


FIG. 11.

It should be remembered that *temperature is reduced by elevation*, so that in the mountainous regions the actual temperatures are lower (by about 1° F. for 300 ft.) than those indicated by the isotherms, the readings being "reduced to sea-level" before being plotted on the map.

Rainfall. A glance at the rainfall map shows that the west of these islands is much wetter than the east. This is not only because most of our winds come moisture-laden from the Atlantic Ocean, but also that the higher lands, which cause these winds to rise and become cool enough to deposit their moisture, also lie to the west. Even the lower and remoter eastern counties get sufficient rainfall, for westerly winds are by no means constant, and London's mean annual rainfall of some 26 in. cannot be accounted for by the height of Hampstead Heath. But moving generally from some westerly point to some easterly point across these islands, centres of low atmospheric pressure known as *cyclones* are of frequent occurrence. Winds are drawn into these centres from all sides, and, rising, are cooled sufficiently to deposit their moisture as rain or snow.

The broken nature of the mountains of Ireland allows the rainfall to be more evenly distributed there than in Great Britain, and the map clearly shows that the gap of the Bristol Channel between the Welsh mountains and Exmoor allows the penetration of considerable rainfall towards the Midland Plain.

The relative dryness of East Anglia is naturally associated with relative absence of cloud and greater amount of sunshine, all of which are important factors in the cultivation of cereals; while the mildness and wetness of the Irish Plain and the western coastal plains of Great Britain encourage the growth of rich pasture suitable for cattle-rearing. The moist climate of Lancashire has aided the development of its large and important cotton industry (see p. 85).

The rainfall is fairly evenly distributed throughout the year, and, in this country, the seasonal distribution is of small economic importance.

CHAPTER IX

THE BRITISH ISLES (*continued*)

INDUSTRIES AND PRODUCTIONS

The Development of Industry—Forestry—Fishing—Pastoral Industry—Agriculture—Sites of Market Towns—Mining.

THE various forms of industrial activity will be considered as far as possible in their natural order of development. Primitive man was, and is, almost entirely dependent on geographical conditions for his means of livelihood. He lived in natural caves, hunted the animals, and collected the fruits of the forests, and fished in the rivers and seas. Later he learned to domesticate cattle to assure him of more constant food supplies, and in time to cultivate the open spaces or forest clearings that he himself had made wherever the climate gave encouragement to his efforts. This led him to relinquish his wandering life, to settle down, and to build himself a more convenient dwelling. From this point his progress in art and industry was rapid. He learned to work the minerals found in the rocks, and metals superseded wood and stone in the making of his weapons and utensils. At first each individual did all these things for himself, but a settled community soon discovered that it was for the general good for some to specialise in each of the particular activities of life: while some looked after the cattle, others tilled the soil; some were builders, others made clothing, and so on. Meanwhile, man's conquest of wind and

wave had been progressing steadily, and he began to cross the seas, finding and bringing back articles he could not obtain in his own land; thus began commerce, which is such an important factor in the economic life of most countries to-day.

In the varied activities of modern life it is often difficult to trace the influence of geographical conditions, which man's genius has often helped him to modify; but a careful study will show that modern man, no less than his ancestor of the Stone Age, is more dependent upon these conditions than he is always apt to realise.

Forestry. The mild wet climate of the British Isles would allow of them to be covered with forests, and there seems little doubt that in early times this was actually the case. But so much timber has been cut down for building purposes, to make charcoal for smelting iron, and to give room for pasture and agriculture, that at the present time only a little over 4 per cent. of the whole area is forested. The largest areas remaining are the New Forest in Hampshire (about 400 sq. miles), and the Forest of Dean in Gloucestershire. The famous old forests of the Weald, Epping and Sherwood have almost disappeared. The deer "forests" of the Highlands of Scotland are merely open moorland.

The value of the timber, mainly oak, elm and beech, obtained from the forests, and the number of persons employed in the industry are therefore small, and no less than 34 million pounds' worth of timber was imported for building purposes and pit-props in 1913. Most of this came from Scandinavia, Germany and Russia. It has been suggested that the reafforestation of areas unsuitable for agriculture would be of great economic value to the country.

Hunting is now a sport rather than an industry in the British Isles, although various "game" animals and birds are useful for food.

At one time herds of pigs lived on the acorns and

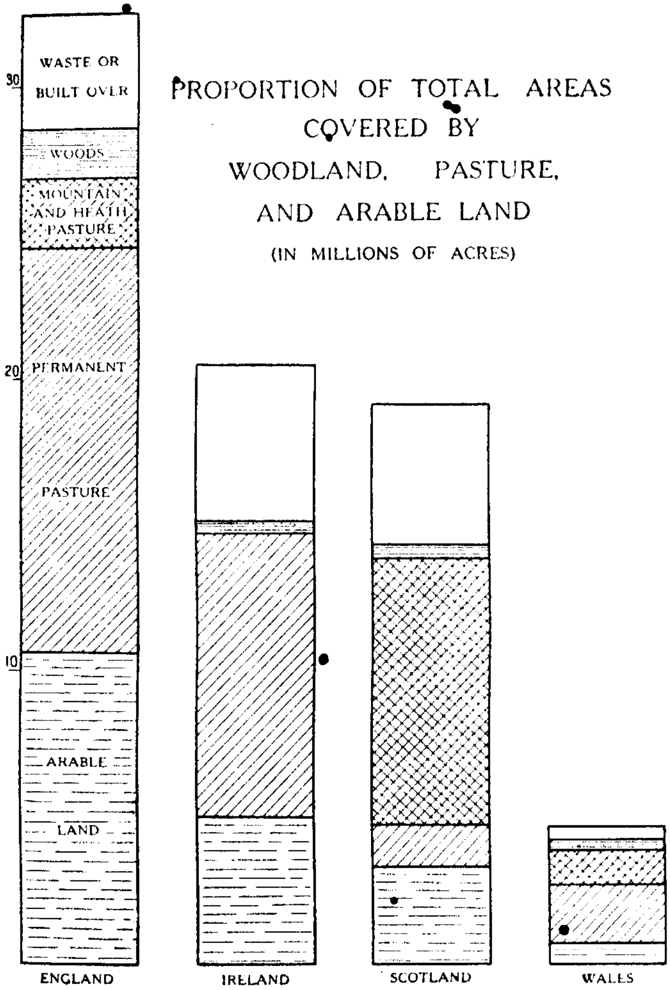

PROPORTION OF TOTAL AREAS COVERED BY WOODLAND, PASTURE, AND ARABLE LAND
(IN MILLIONS OF ACRES)
WASTE OR BUILT OVER
WOODS
MOUNTAIN AND HEATH PASTURE
PERMANENT PASTURE
ARABLE LAND
30
20
10
ENGLAND
IRELAND
SCOTLAND
WALES

FIG. 12.

beech mast in the forests of this country, as they still do in Serbia.

Fishing. River fisheries are now economically unimportant, but the sea fisheries around the British Isles are of the utmost importance. However, *salmon* is sent to market from the estuaries of the Spey, Dee, Tay and Tweed in Scotland, the Bann and Shannon in Ireland, and the Eden and Severn in England. The following are the chief sea-fishing grounds.

1. *The North Sea.* Here the greatest catches are made on the Dogger Bank and other shallow "banks" which lie more than 100 miles from the coast, and are also visited by Dutch, German and Danish fishermen. The fish caught in the "trawls" include *plaice, soles* and *turbot,* and sometimes *cod, haddock* and *skate,* which are also caught in rather deeper water by long lines and drift nets. The fleets of sailing and steam trawlers leave the ports of *Grimsby, Lowestoft, Yarmouth, Hull, Aberdeen, Leith, Peterhead* and *Wick,* and sometimes remain at sea for several weeks, either keeping the fish alive in tanks or sending them back to market by the fast steamers that visit the fleet from day to day. Much of the fish goes direct to Billingsgate Market in London by the steamers, and fish trains are run daily from Aberdeen to London. The rest goes to feed the large industrial populations of the midlands and the north of England.

The *herring fishery* of the North Sea is very important. The shoals seem to migrate southwards from the north of Scotland, where they are found in early summer, to the English Channel, where they arrive in winter. The herrings are found much closer to the shore, and besides the ports already named many smaller towns, including *Lerwick, Kirkwall, Fraserburgh* and *Whitby,* send out their sailing boats.

Oysters are caught in the estuaries of the Thames

and Colne, at Whitstable and Colchester, and shrimps in the Thames and Wash.

About three-quarters of the total annual British catch comes from the North Sea, and many Scots women and girls find employment in salting and packing the herrings in barrels for export to Germany, Russia and Holland.

2. *The English Channel.* The *mackerel* fishery is here the most important. Off the coasts of Cornwall and the Scilly Isles *pilchards* are caught in the summer and autumn months, and *lobsters*, *crayfish* and huge *crabs* are trapped on the submerged rocky ledges. The pilchards are mainly salted and exported in barrels to Italy. Hastings, Brixham, Plymouth, Penzance, St. Ives and many smaller villages, especially in the south-west, are largely concerned in the Channel fishing.

3. *The Irish Sea.* This area is fished by trawlers from Cardiff, Liverpool, Dublin, Whitehaven, Douglas, and other ports, and the catches go to feed the industrial populations of South Wales, Lancashire, Dublin and Belfast.

4. *The Atlantic Coasts.* The inhabitants of the barren, rocky Western Islands and Highlands of Scotland and Ireland are compelled to eke out their slender means of subsistence by fishing, but owing to the great distance from markets the industry is not developed to its full extent. *Cod* and *herring* are the most important. Stornoway in the Hebrides and Galway on the west coast of Ireland are the largest ports.

The fisheries of the *Firth of Clyde* and *Loch Fyne* are important in relation to the dense population of the Central Lowlands.

During the last five years the average annual value of the fish caught around the British Isles has been about 12 million pounds. Some 4 million pounds' worth, consisting chiefly of tinned sardines from Norway, France and Italy, and tinned salmon from

Canada, is imported. Our annual exports of fish, principally consisting of herrings, are valued at about 6 million pounds.

The importance of the fishing industry in supplying reserves of suitable men for the navy has already been pointed out.

Pastoral Industries. Just over half of the total area of the British Isles is given up to the rearing of animals, and supports about 30 million sheep, 12 million cattle, 4 million pigs and 2 million horses. A third of this area is poor mountain pasture quite unfitted for cultivation.

Sheep have always been of great value, not only for food, but in supplying the principal raw material for the clothing of a people inhabiting a country with a cool temperate climate. In the Middle Ages wool was indeed the chief British export, and the use of the "Woolsack" as the seat of the Lord Chancellor in the House of Lords dates from this time. And although home demands for wool and mutton have now outgrown the supply, which needs supplementing from Australia, New Zealand and Argentina, large flocks are still reared. They thrive best on the *drier eastern slopes of the mountains, or on the porous limestone and chalk hills,* such as the Cotswolds, the Downs and the Wolds of Lincoln and Yorkshire.

In proportion to their areas Wales is the most and Ireland the least important country for sheep, but in absolute numbers England is easily first. The "border" counties of Scotland are famous for their sheep, the "Cheviot" breed supplying the raw material of the "Tweed" woollen industry.

The smaller Welsh, Scotch and South Down sheep are famous for mutton, and the larger Cotswold, Leicester and Lincoln breeds for their wool.

Handwoven woollen cloth is still made by the cottagers of the Hebrides (*e. g.* "Harris" tweeds), the Orkney and Shetland Isles.

Cattle require larger and better pastures than sheep, and are kept on *the wetter plains to the west of the country*, where the rainfall, while too heavy for the growth of wheat, produces excellent grass. Thus Ireland is relatively the most important cattle-rearing country, the Golden Vale of Tipperary and Limerick being famous. Dairy produce is her greatest export, the busy and thickly peopled industrial areas across the Irish Sea being good markets. In England cattle-rearing is most important in the plains and valleys of Lancashire, Cheshire, Herefordshire, Devonshire, Cornwall, Somersetshire, Leicestershire and Staffordshire; the cream of Devonshire and Cornwall and the cheeses of Cheddar (Somerset) and Cheshire being well known. Durham "shorthorns" are found all over the country, and give good beef. The counties of the middle Thames Valley specialise in dairy cattle to supply the London market with milk.

In Wales most cattle are reared in the lowlands of Anglesey and Pembrokeshire; and in Scotland, which has relatively few cattle, Wigtown, Aberdeen, Fife and Renfrewshire are the chief counties engaged—the Aberdeen cattle being famous for their beef.

Splendid milch cows are reared in the Channel Islands.

Home-bred cattle are quite insufficient to satisfy the demand for beef, cheese, butter and milk. Cattle and frozen or tinned beef are imported in large quantities from the United States and Argentina, cheese from Canada and Holland, butter from Denmark, Holland, Australia and New Zealand, and condensed milk from Switzerland and Norway.

Pigs are chiefly reared in the counties famous for their horned cattle, but are found in fairly large numbers in many others. As in the case of cattle, *Ireland rears most* and Scotland least. Irish and Wiltshire bacon are famous, as are also the hams of Yorkshire and Westmoreland.

Horses, although being rapidly displaced for draught

work in towns by motor-driven vehicles, are still reared in considerable numbers for farm work, military purposes and sport. The *East Riding of Yorkshire* and *Clydesdale* are famous for both heavy cart horses and light carriage horses; but most of the *lower and drier eastern counties in England, Scotland and Ireland* rear horses. Small ponies are reared in the Shetland Isles, the Highlands of Scotland and Wales, and on Dartmoor.

Agriculture. A little more than a quarter of the total surface of the British Isles is returned as arable land, much the largest proportion being in England, where some 35 per cent. of the country is fit for cultivation, the proportion in each of the other countries being rather less than 20 per cent. About half the arable land is devoted to the growth of cereals and the rest to grass for haymaking, to root crops and green crops used as food by man and beast, and to fruit, hops and flax.

Oats are cultivated on a larger acreage than any other cereal in all the countries. This is because the *crop is hardier and able to withstand poorer conditions of soil and climate,* thriving in Wales, Ireland, Scotland and Western England, where heavy rainfall and poor soil make the growth of wheat almost impossible.

Wheat, the chief British bread-grain, is only grown to a large extent in England, and there it is almost confined to the counties between the Humber and the Thames. The following are the principal conditions favourable to its growth that are found there.

1. *A stiff and fertile soil.* This is provided by the "boulder clay," a product of ancient glaciation, which covers most of the area. Being formed by the grinding and mixing action of the ice-sheet as it moved over the varied rocks of which the surface of England is composed, the soil contains all the valuable elements of plant food.

2. *A sufficient but not too heavy rainfall.* This is the driest part of the British Isles, but serious droughts are infrequent.

3. *A warm and sunny period for ripening the grain.* This district has the highest mean summer temperature in the British Isles (see p. 65), and a greater absence of cloud than any other region.

4. *Flat country, to facilitate farming operations,* such as ploughing, sowing and reaping.

A little wheat is grown in the counties around the Firth of Forth, and in the midland and south-eastern counties of England.

By careful scientific farming and the use of manures the British farmer obtains a larger crop of wheat per acre (over thirty bushels) than is obtained in any other part of the world. Still, *only one-fifth of the wheat consumed in the British Isles is home grown.* About half the remainder comes from the British countries of India, Canada and Australia, and the rest from the United States, Argentina and Russia (see p. 104).

Barley is grown to about the same extent as wheat, although its area of cultivation is wider as it needs less sun. It is cultivated in the Central Lowlands and Highland glens of Scotland, and in Ireland for use in the distilling of whisky.

Rye is only cultivated to a very small extent, being grown mainly as fodder in parts where soil and climate are too poor for other cereals.

Hay is extensively grown for winter food, and to feed the horses used for work in towns where pasturage is impossible. The stiff "London clay" soil and proximity to London make Middlesex a great hay-growing county.

Potatoes are an important food staple, especially in Ireland, where they are most largely cultivated, a greater area being devoted to them than to all other root crops in that country.

Turnips, swedes and mangolds are grown chiefly

for winter food in the cattle and sheep-rearing districts.

Fruit—apples, plums, cherries, etc.—is most largely grown in the counties of the Weald, the Lower Severn Valley and the Carse of Gowrie, between the Sidlaw Hills and the Firth of Tay, in which regions the mixed soils of sands and clays seem to be very suitable, but small orchards are found in many parts. Jam is made in all these districts, and Dundee now imports oranges for making marmalade.

Early fruit, vegetables and flowers are sent to London and other markets from the Channel Islands, the Scilly Isles and Cornwall, where their production is favoured by the mild climate and absence of frosts. Cider made from Devonshire and Herefordshire apples is famous.

Hops, used in flavouring beer, are grown chiefly in Kent and Worcestershire and the neighbouring counties.

Flax is only grown to any extent in Ulster, where, however, the linen industry is still largely dependent upon raw material imported chiefly from Russia.

Agricultural Villages and Market Towns

The very nature of pastoral and agricultural industries prevents great concentration of the population in the districts where they are carried on. The workers live mainly in small villages scattered over the fertile areas within reach of supplies of drinking-water from springs, streams or wells. Thus farming villages are found all along the foot of the chalk escarpment of the Downs in south-eastern England, where rain-water which percolates through the chalk and greensand issues in springs at the junction with the gault clay, where also a mixture of soils adds to the fertility. Villages on the Downs themselves are few and far between, owing to their dryness and the

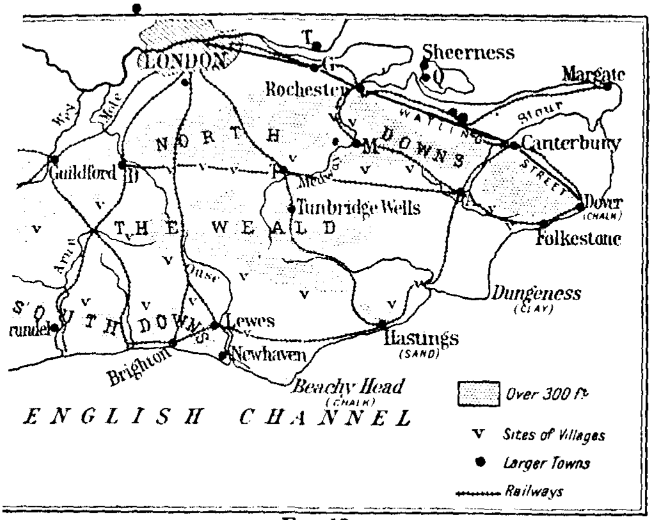
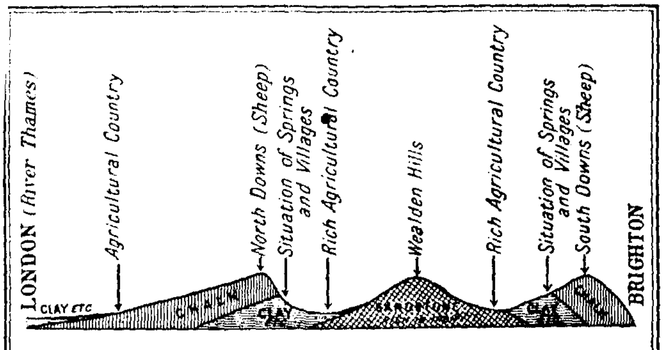


Fig. 13.



Rough Section from London to Brighton across the Weald

Fig. 14.

poorness of the soil. Their short grass, however, makes them fine sheep-walks

Among the villages have grown up at the most accessible points market towns, where the farmers can meet for the interchange of produce and ideas, and where the villagers can purchase articles of food and clothing unobtainable nearer their homes. Many of these market towns are very old, but most are still relatively small, few exceeding 50,000 inhabitants, unless they have adopted some more modern manufacturing industry. Their ancient importance, dating from a time when the wealth of the country was simply regarded as the wealth of its fields, is shown by the existence in many of these market centres of magnificent churches and cathedrals, and the common expression, "a sleepy cathedral city," is indicative of the change that in recent years has come over the economic life of the country.

The sites of the market towns have been mainly determined by their accessibility from the surrounding country, and, originating before the times of railways or even of canals, are situated at the meeting-points of important roads and rivers. A gap made by a river in a ridge of hills, which interrupted communication between the country on either side, was of the greatest importance, and the "gap towns" of *Canterbury*, *Rochester*, *Guildford*, *Lewes*, *Arundel* and *Lincoln*, owe their existence largely to this cause. The first two also mark the crossing of the rivers Stour and Medway by Old Watling Street, and the Fosse Way reached the Witham at Lincoln.

The names *Hereford*, *Oxford*, *Cambridge*, *Bridgwater* and many others, suggest the origin of those places.

York on the Ouse and in the middle of its wide and fertile vale, *Peterborough* on the edge of the rich drained Fenland, *Norwich* with modern starch and mustard manufactures based on locally grown produce, *Reading* in the centre of the fertile Thames Valley and at the confluence of the Kennet tributary, and *Ipswich* with its flour-mills and manufactures of agricultural implements, are ancient market towns

with considerable modern importance. In the west of the country the old cathedral cities of *Chester* on the Dee, *Worcester* and *Gloucester* on the Severn, and *Exeter* on the Exe in Devonshire are important, and their names show that their sites were considered worthy of defence in Roman times.

Practically all the inland towns of Ireland are market towns, as are also those between the Firth of Tay and Inverness in Scotland.

Mining and Quarrying. In 1912 over 130 million pounds' worth of minerals were extracted from the mines and quarries of the British Isles, and over eleven hundred thousand men were employed in the work. Of these some 118 million pounds represents the value of *coal* alone, and the coal-miners exceed a million in number. Besides giving employment to so many, this *enormous output of coal* is of the greatest importance in providing (1) household fuel in a country where timber is scarce; (2) power for driving machinery, which is so important in modern industry; (3) a valuable and bulky cargo for outgoing ships which have brought large supplies of food and raw materials to our shores. This allows freights on the imports to be lower than if the ship had to return in ballast. The principal coal-fields in the order of their annual output are as follows (figures for 1912 in millions of tons)—

1. *The Yorkshire, Derby and Nottingham Coal-field* (66). The output is mainly used to support local textile and iron and steel industries, only some 6 million tons being exported from Hull and Grimsby.

2. *The South Wales Coal-field* (53). The anthracite and fine steam coal from this field are in great demand, no less than 28 million tons being exported from Cardiff, Newport, Swansea and Port Talbot. The coal-field also supports large iron, copper and tin-smelting industries.

3. *The Durham and Northumberland Coal-field*

(51). This supports large iron, shipbuilding and chemical industries, supplies London with much of its fuel, and exports some 18 million tons chiefly to countries across the North Sea.

4. *The Forth and Clyde Coal-fields* (50). These support large textile, machinery, shipbuilding and chemical industries, and export coal from Glasgow and Ayr to Belfast for use in the shipyards, and from several ports on both sides of the Firth of Forth, notably Methil, Burntisland, Leith and Grangemouth.

5. *The Lancashire and Cheshire Coal-field* (23) supports the enormous cotton and textile machinery industries of those counties.

6. *The Staffordshire Coal-fields* (14) support the earthenware industry of the potteries around Stoke-on-Trent in the north, and the great metal industries of the Black Country around Birmingham in the south.

Smaller coal-fields with a total output about equal to that of the last named are situated (1) between Workington and Whitehaven on the coast of Cumberland, supplying the shipbuilding industries of Belfast and Barrow; (2) near Bristol, supporting cocoa, tobacco and other industries of that city, and the west of England woollen industry of Wiltshire; (3) near Leicester, supporting the hosiery and boot industries of that town; (4) from Shrewsbury to Kidderminster in the Severn Valley, and (5) in Flint and Denbighshire.

Small quantities of inferior coal are mined near Castlecomer in County Kilkenny, and lack of coal is, perhaps, the greatest economic drawback of Ireland.

Iron is by far the most important of the other minerals. Its value has been recognised from earliest times, when it was smelted from its ores by means of charcoal obtained in the forests. Thus the Wealden Forest, the sandstone of which neighbourhood is

rich in iron (*cf.* the chalybeate mineral springs of Tunbridge Wells), was once a centre of the iron industry, and it is said that the railings around St. Paul's Cathedral were made from Wealden iron. Since the eighteenth century, however, iron ores have been smelted chiefly with coal or coke.

The modern demand for British machinery, railways, steel bridges and iron ships, has now become so great, however, that in spite of the fact that Great Britain is the third largest producer of iron ore in the world, the value of the ore imported is about twice as great as of that which we produce ourselves. It is chiefly obtained from Spain and Sweden.

Fortunately for this country, its iron ores are found along with or very near to its supplies of coal. It is mined in largest quantity and finest quality in the following districts—

(1) The Cleveland District of Yorkshire, where the *limestone* with which it is associated is of great value as a flux in the smelting process.

(2) The Furness District of Lancashire and neighbouring parts of Cumberland.

(3) In various parts of the Midlands of England.

(4) In the Central Lowlands of Scotland.

The other minerals in order of value produced are the following—

Building Stones. These include (1) *limestone,* quarried at various points in the great belt which extends from Portland to Whitby, the first named, together with Bath and Mansfield, being well-known centres; (2) *granite* from Aberdeen, Peterhead, Charnwood Forest in Leicestershire, Carnarvon and the Wicklow Mountains; (3) *marble* from Kilkenny, Galway, Devonshire and Derbyshire; (4) *slates* from the Snowdon Group in North Wales, Cumberland and Argyllshire. Penrhyn Quarries and Port Dinorwic on the Menai Strait are famous for slate.

Clay. This is dug out for different purposes. Where mixed with sand it is largely used for *brick-*

making, London being almost entirely built of bricks owing to the abundance of brick-earth in the neighbourhood. Clay suitable for making earthenware established the potteries in the North Staffordshire coal-field; but the fine white *kaolin, or china clay*, used in making porcelain, is obtained from the decomposed granite in Cornwall. *Fireclay* used for lining furnaces is found in many parts, and fortunately near the iron districts, *e. g.* Sheffield and Stourbridge.

Tin Ore has been mined in the granite of Cornwall from earliest times, and with the application of newer and more scientific methods is still obtained in considerable quantities. Very small quantities of *copper* are also mined in the same district. Redruth is a mining centre.

Oil Shale is mined in Linlithgowshire, and from it petroleum and paraffin wax are obtained by distillation.

Salt is not only valuable for domestic purposes, but is also the basis of many chemical products, notably soda, which enters largely into the manufacture of soap and glass. It is chiefly obtained from "brine springs" (1) in Cheshire along the Weaver Valley at Northwich, Middlewich and Nantwich; (2) in Worcestershire near Droitwich, and (3) in the south of Durham.

Lead is mined in small quantities in the Peak District of Derbyshire, in the Isle of Man, and the Leadhills in the Southern Uplands. The old lead mines of "Mendip's sunless caves" are worked out.

Chalk, which is burnt in kilns to make *lime*, and, mixed with river mud, to make *cement*, is quarried in the Downs, especially along the lower Thames and Medway.

CHAPTER X

THE BRITISH ISLES (*continued*)

INDUSTRIES AND PRODUCTIONS (*contd.*)

Manufactures—Textile Industries—Metal Work—Other Manufactures.

"MAKING by hand," which is implied in the word manufacturing, is now carried on to a very small extent indeed in the British Isles, the elaboration of natural products being almost entirely carried out by machinery in smaller or larger factories. This demands iron or steel for the manufacture of machinery and power to drive it. In this country the cheapest and most accessible source of power is coal, and consequently the great manufacturing industries have been attracted to the coal-fields, where, as has already been noted, supplies of iron are also readily obtainable. In a few cases, where there are special facilities, or where the transport of raw material would be more expensive than that of the coal, or where there is a large local demand for the products, manufactures have sprung up away from the coal-fields, *e. g.* shipbuilding at Portsmouth and Belfast, the making of cement on the Thames and Medway, and the many miscellaneous industries of London.

Modern manufacturing processes, by being able to offer relatively high wages, tend to concentrate large bodies of workmen and their families into small areas surrounding the factories, and have thus given rise to many large towns where natural conditions favour the production or ease of distribution of the manufactured articles. This has tended towards the depopulation of many rural districts, a consequent decline in agriculture, and therefore a greater dependence upon foreign supplies of foodstuffs,

which the surplus products of the newer industries make it possible to purchase.

I. Textile Industries, *i. e.* those concerned in the spinning and weaving of various fibres into cloth, are the most important. Their output is valued at about 200 million pounds per annum; they employ over a million workers, and supply more than a third of the total value of our exports. Before the fourteenth century most of the cloth used in this country was imported from Europe, and wool was an important export. But Edward III encouraged the settlement of Flemish weavers in East Anglia, and these taught the people to make the fleeces of the flocks kept on the Downs and Wolds into clothing for themselves. The industry spread towards and, in time, even across the Pennines, and when the woolly fibre of the cotton plant was introduced from the Levant, and later from the United States, it was found that the damper climate of the western side of the country was better adapted to working the more brittle material. Thus there was a considerable textile hand industry in England before the introduction of the spinning-jenny and the power loom and the general use of steam-driven machinery. But these factors finally determined the concentration of the industries in the Pennine coal-fields and the decline of the industry in the coalless centres of its early introduction.

Large supplies of coal and iron, the genius of British inventors, the enterprise of British merchants and the skill of British workmen, freedom from hostile invasion, and the large market for cotton clothing to be found in India with its 300 million inhabitants, soon raised Great Britain to the position of the greatest textile producer in the world; a position she still holds, but which is now being seriously challenged by the recent development of the resources of other countries, notably the United States and Germany, and the manufacturing of

textile goods in countries such as India and Japan, which were formerly among our best customers.

1. *The Cotton Trade* alone is now by far the most important manufacturing industry in the country. Raw cotton ranks second only to wheat in the value of our imports, and cotton goods form almost exactly a quarter of our total exports.

It is confined almost entirely to the Lancashire and Lanarkshire coal-fields, and is especially important in the former. The conditions favouring the industry in both cases are—

(*a*) Local supplies of iron and coal for making and driving machinery.

(*b*) A damp climate facilitating the spinning and weaving processes.

(*c*) Facilities for importing the raw cotton, three-quarters of which comes from the United States, most of the rest from Egypt, and a little from India.

(*d*) Ease of obtaining chemicals for bleaching and dyeing, local supplies of coal and salt favouring chemical industries.

Various towns specialise in different branches of the industry.

Manchester, converted into a seaport by the construction of the Ship Canal, is the great market centre of the whole industry both for the buying of the raw material and the sale of finished products.

Bolton, Oldham, Rochdale, Stockport and *Bury* specialise in spinning; while *Blackburn, Preston* and *Burnley* are the largest of the weaving centres.

Paisley, in the Central Lowlands, specialises in cotton thread. Cotton hosiery and lace, made of coarser cotton yarns, are successfully manufactured in the drier district of *Nottingham.*

British cotton goods find a market in all tropical and subtropical lands, and the finest "counts" of Lancashire even in the countries of her greatest rivals.

2. *The Woollen Trade* is now mainly concentrated in the West Riding of Yorkshire, although the industry thrives in Wiltshire and in the Tweed Valley. All these districts possess the advantages of—

(*a*) Local supplies of wool from the Pennines, the Cotswolds and the Cheviots respectively.

CENTRES OF THE TEXTILE INDUSTRIES OF LANCASHIRE AND YORKSHIRE.

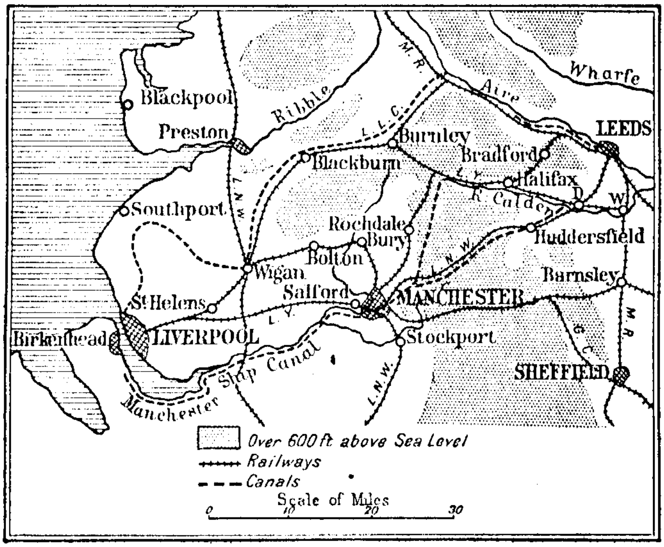


FIG. 15.

(*b*) Streams for washing the wool and, in early times, for supplying power.

(*c*) Easily accessible supplies of coal in the West Riding, Bristol and Midlothian coal-fields respectively.

The additional facilities for importing foreign supplies of wool and for reaching the great markets of

the colder countries of Europe, afforded by the Humber estuary and its connecting rivers and canals, together with its larger supplies of coal and iron, have made the West Riding by far the most important.

The imported wool comes mainly from Australia, New Zealand and Argentina; *mohair* from the Angora goats kept on the hill slopes in Asia Minor and Cape Colony, and *alpaca* and *vicuna* wool from the Andes of Peru and Chile.

Leeds, the chief centre of the industry, makes coarse woollen goods, including flannels, blankets and coarse cloths. *Bradford, Halifax* and *Huddersfield* specialise in the finer " worsteds " used for suitings and dress materials, in which the mohair and alpaca are used up. *Batley* and *Dewsbury* make " shoddy " from old woollen cloth and wool " waste."

Bradford and *Trowbridge* in Wiltshire, and *Stroud* in Gloucestershire are famous for " West of England " broadcloth and tweeds.

Hawick and *Galashiels* are the centres of the " Tweed " industry of Southern Scotland.

Leicester, with local supplies of coal and the sheep pastures of Lincolnshire close at hand, specialises in woollen hosiery.

Carpets are made from local supplies of wool at *Kilmarnock, Kidderminster, Wilton* and *Axminster;* and *flannel* is made from the wool of the Welsh sheep in the upper Severn Valley at *Welshpool* and *Newtown.*

" Harris " and " Irish " tweeds are made by hand in the cottages of the Hebrides and Connaught.

3. *The Linen Trade* is chiefly carried on in north-east Ulster, in Forfarshire and Fifeshire, and in the West Riding of Yorkshire. In the first and last named regions flax is grown; but all import large quantities from Russia, where it is grown in the forest clearings, and finer qualities from Belgium. Good water for bleaching, the damp climate of the first two districts and abundance of coal in the third,

favour the industry. The chief centres are ***Belfast*** and ***Lisburn*** in Ireland, which produces the finest qualities; ***Dundee, Arbroath*** and ***Dunfermline*** in Scotland, and ***Barnsley*** in England. The beautiful Irish lace is hand-woven from linen thread.

4. *Jute and Hemp industries* are carried on in the Scottish centres noted for linen. The *jute,* which is used for making coarse sacking and sailcloth and also for adulterating linen fabrics, is imported from the Ganges Delta. *Hemp,* imported mainly from Russian Poland and the Philippines, is chiefly used in making rope.

5. *Silk,* imported from Italy, China and Japan, is spun and woven on the coal-fields around the Southern Pennines, where the water of local streams is specially suitable for dyeing. ***Macclesfield, Congleton, Leek*** and ***Derby*** are the chief centres. *Poplin,* a fabric made from silk and cotton, is manufactured in Dublin.

II. METAL INDUSTRIES rank next to textiles in order of importance, supplying about a quarter of our total exports. They include the smelting of home-produced and imported ores, and the manufacture of metal goods of all kinds, rails, machinery and ships. In every case the supply of power is of the greatest importance, and the industries have become centred upon or near the coal-fields in consequence.

1. *The Iron Trade* is most important, and ranks second only to cotton. *Smelting* is chiefly carried on at Middlesbrough, in the Cleveland District, Barrow-in-Furness, the Black Country around Birmingham, Airdrie on the Clyde coal-field and Rotherham in the West Riding, where the greatest quantities of iron ore are found, and at Merthyr Tydvil and Newport in South Wales; most of the ore used in the latter places and much in the others now being imported from Spain. In connection with the various manufactures of iron and steel the following should be noted.

Birmingham and the other midland centres, being relatively far from the seaports and transport being in consequence expensive, specialise in articles of considerable value in proportion to their bulk, *e. g.* rifles, locks and keys (at *Walsall and Wednesbury*), bicycles (at *Coventry* and *Wolverhampton*), chains (at *Cradley Heath*), needles and fish-hooks (at *Redditch*). For the same reason they also specialise in locomotives and motor-cars, which are necessary for land transport, and are capable of transporting themselves to wherever they may be required.

Sheffield has become famous for its *steel* and *cutlery* for the following reasons—

(*a*) Local iron ore smelted with charcoal from the local forests made the best steel in olden times.

(*b*) The " Millstone Grit," a sandstone obtained from the local Pennines, made excellent grindstones for giving a keen edge to knives, swords, tools, etc.

(*c*) The water of local streams was said to possess excellent " tempering " qualities.

(*d*) The abundance of local coal, when that came into general use for iron smelting.

(*e*) The facility of obtaining Swedish iron, which owes its great value for making steel to the fact that it is smelted with charcoal, owing to the presence of large forests and absence of coal in Sweden.

Salford, *Oldham* and *Bolton* in the cotton district, *Keighley* and *Leeds* in the woollen and linen district, specialise in *textile machinery* for those industries, and *Glasgow* also has similar industries. Textile factories in the United States, China and Japan obtain their machinery from Great Britain.

Middlesbrough and *Barrow* specialise in steel rails and bridge-making materials.

Glasgow and other *Clyde Ports*, *Newcastle* and other *Tyne Ports*, *Sunderland*, *Hartlepool* and other *Tees Ports*, *Belfast*, *Barrow* and, to a smaller extent, *Hull*, *Liverpool* and *London*, having facilities for obtaining coal and iron and for launching vessels, specialise in

shipbuilding. The chief naval dockyards are at *Portsmouth, Devonport* and *Chatham.*

Crewe, Swindon, Derby and *Doncaster* have large *Railway Works*, being at the junction of important branches with the main lines of their respective routes.

Grantham, Norwich and *Ipswich* specialise in *agricultural implements* to supply the big local demand.

2. *Copper Smelting* and the *Tinplate Industry, i. e.* the coating of sheets of iron with tin to prevent rusting, are important on the South Wales coal-field, especially at *Swansea* and *Llanelly,* Cornish copper and tin ores being brought there for smelting in very early times. *Copper* is now imported from Spain, Canada, Chile, South Africa and South Australia, and *Tin* chiefly from the Straits Settlements and Queensland. These industries have also attracted a trade in *lead* and *zinc.* Palm oil is imported from the Guinea coasts for use in the tinplate industry.

3. *Electroplating, i. e.* coating baser metals with silver or gold by means of electrical processes, is carried on at *Birmingham* and *Sheffield,* where brass is also made.

III. Other Manufactures.

1. *Chemicals and Glass,* dependent upon supplies of coal and salt for their manufacture and largely upon the textile and soap industries for their markets, are important industries on the Lancashire coal-field at *Widnes* and *St. Helens;* on the Clyde coal-field at *Glasgow;* on the Northumberland and Durham coal-field at *Newcastle,* and also at *Stourbridge,* which obtains salt from the Droitwich neighbourhood and coal from the Black Country, and *Belfast,* with local supplies of salt and coal from Ayr and Whitehaven.

2. *Soap,* requiring fats and soda, is manufactured at Birkenhead, Glasgow and London, where imports of tallow can be obtained from North America, Argentina and Australia, and palm oil from West

Africa, coconut oil from the same source and also from the East Indies, and cotton-seed oil from India, Egypt and the United States of America.

3. *Earthenware* is made in "*the Potteries*" around *Stoke-on-Trent*, where there are local supplies of clay and coal, supplemented by Cornish kaolin brought to the Mersey by sea and thence by canal. *Worcester*, *Derby* and *London* also have porcelain works.

4. *Paper* is manufactured from wood pulp imported from Sweden and Newfoundland and esparto grass from Spain and Algeria at several small towns in the Chilterns and North Downs, where there is pure water to be obtained from streams or wells, and which are also near to London, whose many newspapers and books form the chief market for the produce. *Dartford*, *Sittingbourne* and *Maidstone* in Kent are important.

The pure water of the Esk, the facility for importing pulp from Norway, and the large publishing trade of *Edinburgh*, account for the paper industry of Midlothian; just as the large population, the Pennine streams and the waste fibre from the textile industries have encouraged the industry at Darwen and Bacup in Lancashire.

5. *Leather* and *Boots and Shoes* are largely made at *London* and *Northampton*; in the first place due to the large demand and the facility of importing hides and tanning material, and in the second due to the cattle pastures of the Midlands, oak-trees supplying bark for tanning, and the dense industrial populations close at hand.

6. *Beer* is brewed at Burton, London, Dublin and other places where the water is suitable and barley (for malt) and hops can easily be obtained. *Whisky* is distilled in most of the large towns of Scotland and Ireland where barley is obtainable.

7. *Sugar* refining and the manufacture of *cocoa* and *tobacco* products are still carried on at *Bristol*, *Glasgow* and *London*, owing to their early association

with the West Indian trade which brought the raw materials to those ports.

8. *Biscuit-making* at *Reading* and *Straw-plaiting* at *Luton* owe their origin to the fertile corn lands in which they are situated.

CHAPTER XI

THE BRITISH ISLES (*continued*)

COMMUNICATIONS AND TRANSPORT

Rivers and Roads—Canals—Railways—Motor Transport.

IN a country like the British Isles, where economic development has reached a very advanced stage and industries have become so specialised in various localities, good means of transport of the various productions from one district to another are essential to the life of the community. This need is emphasised by the increasing dependence of the country upon foreign supplies of foodstuffs and raw materials purchased with its surplus manufactured products, the lines of communication between the centres of production and the seaports being of the most vital importance.

The most inhabitable parts of the British Isles have always been supplied with a large number of navigable rivers. The clearing of tracks through the forests was also not difficult, and in most parts some form of hard rock was available to make these roads fit for wheeled traffic, and it can be safely asserted that no village of any size lies more than a mile from a well-made highway. When the need for transporting large quantities of heavy and bulky material became greater, the surface features of the country

offered few obstacles to the construction first of canals and then of railways, which now cover the country with a finer network of communications than can be found in any area of equal size on the earth's surface.

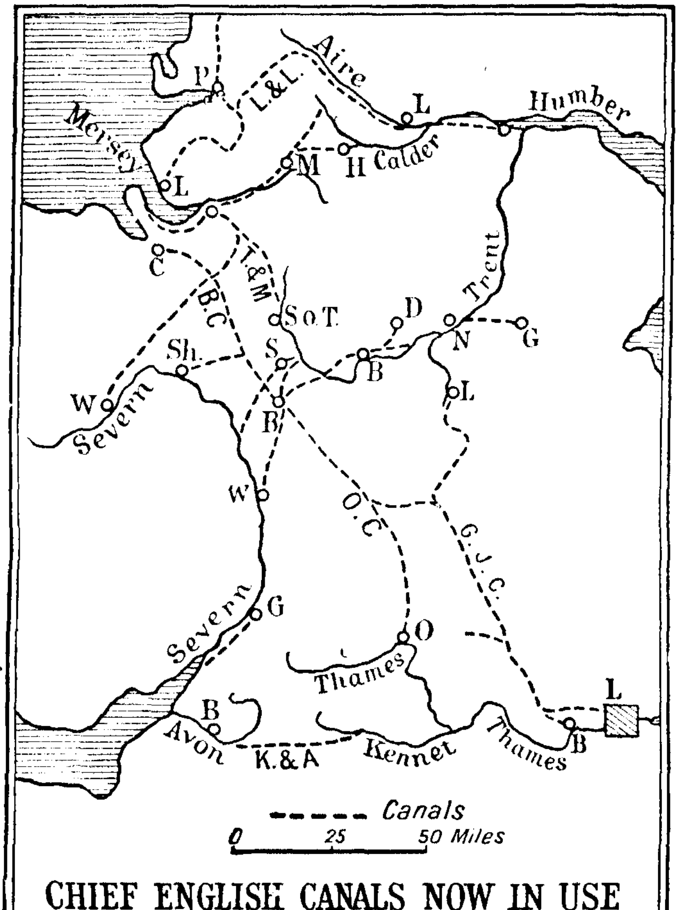
Canals. With the exception of the few short, but highly important, ship canals, most of these were constructed in the later part of the eighteenth and earlier part of the nineteenth century; but, on account of the enormous industrial development since then, they are now neither wide enough nor deep enough for considerable traffic. This, added to the competition of the railways, which have in many cases bought up the canals, has led to their relative and, in some instances, absolute decline. There are, however, some 4000 miles of canals still in use, carrying annually some 40 million tons of produce.

Birmingham, the largest inland city in the country, has naturally become the centre of the *barge canals.* It is connected with the *Upper Thames* by the *Oxford Canal*, and with the *Lower Thames* and London by the *Grand Junction Canal*, which crosses the limestone ridges of Northampton and the chalk ridges of the Chilterns by stairs of locks. The *Shropshire Canal* connects it with the *Upper Severn* at Shrewsbury, and the *Worcester Canal* with the *Lower Severn.* Other canals run to the *Trent* near Stafford and Burton, and the important *Birmingham Canal* connects with the *Mersey* near Runcorn. So by its canals Birmingham has direct water routes to the four great estuaries of the country.

Other barge canals of some commercial importance are—

The Leeds and Liverpool Canal, connecting the Humber and the Mersey, the woollen and the cotton districts, by the natural Aire Gap across the Pennines. A branch leads from Blackburn to Preston.

The Manchester and Calder Canals, connecting the Irwell with the Calder (1) via Rochdale, and (2) via



CHIEF ENGLISH CANALS NOW IN USE

Fig. 16.

Huddersfield, the latter crossing the Pennines in a tunnel three miles long.

The Trent and Mersey Canal, from the Potteries, via the Weaver Valley, to the Mersey estuary.

The Thames and Severn Canal, connecting the Upper Thames at Lechlade with the Severn estuary.

The Kennet and Avon Canal, giving direct water connection, via the Thames, Kennet and Avon, between London and Bristol.

In *Ireland* the flatness of the country and abundance of water have facilitated the construction of canals. Dublin is connected with the Shannon across the great Central Plain by the *Royal* and *Grand Canals*, and another runs from the latter to the upper limits of navigation of the Barrow, affording an inland water route from the capital to Waterford Harbour.

Ship Canals. By far the most important is the *Manchester Ship Canal*, opened in 1894 to supplement the old eighteenth-century Bridgewater Canal and enable ocean-going vessels with cargoes of cotton and foodstuffs to reach Manchester direct. It runs from Eastham on the Cheshire side of the estuary along the line of the Mersey for 35 miles. Only four locks are necessary at the upper end, and in most of its length two large ships can easily pass, the canal having a bottom width of 120 ft. and a depth of 28 ft. The traffic and receipts of this canal alone make up about a quarter of the total for all the canals in the country.

The Berkeley Ship Canal is a straight channel, 16 miles long and 15 ft. deep, from Gloucester to the Severn estuary.

The Forth and Clyde Canal, from Grangemouth to Dumbarton, is available for small ocean-going vessels, and the commercial and strategic advantages to be derived from increasing its width and depth are being seriously considered.

The Caledonian Canal, avoiding the stormy Pentland Firth, and the *Crinan Canal*, avoiding the long journey around the Mull of Kintyre, are also available for small ships, but the unproductive region near

them makes them commercially unimportant. The fine scenery of the Highlands makes them of value in connection with tourist traffic.

Railways. In these times, when railway travelling is so common, there is a tendency to overlook the fact that railways were first established to carry merchandise rather than passengers, and even now the receipts of all the railways from goods traffic exceeds that from passenger traffic in the proportion of about 6 to 5.

Altogether there are nearly 24,000 miles of railway in the United Kingdom (England and Wales 17, Scotland 4, Ireland 3), employing nearly half a million men. A brief summary will be given of the principal economic regions served by the more important lines.

London, being by far the largest city and the capital of the country long before the introduction of railways, has become the centre from which lines radiate in all directions. The chalk and limestone ridges that cross the English Plain are easily negotiated by the natural river gaps or short tunnels; but the higher masses of the Pennines, the Welsh mountains and the Scottish Highlands have restricted the main lines to the coastal plains, except in the few instances mentioned in Chapter I, where it is shown how river valleys have determined rail routes across the higher country. Where the volume of traffic has made the overcoming of large natural obstacles desirable and remunerative, long tunnels and bridges have been constructed, *e. g.* the Severn Tunnel (five miles) on the Great Western direct route to South Wales, the Woodhead Tunnel (three miles) on the Great Central Railway connecting Sheffield and Manchester across the Pennines, the Forth and Tay Bridges (each about two miles) on the North British Railway.

The Great Western Railway serves the fishing, farming and holiday centres of Devon and Cornwall, the mining and manufacturing districts of South Wales, the agricultural and dairy-farming districts

of the Lower Severn and Upper Thames basins, the Black Country, the Irish and American mail traffic via Fishguard, and the Irish, Canadian and West Indian trade, as well as the local industries of Bristol. Mail steamers run from Fishguard to Rosslare and connect with the *Great Southern and Western Railway of Ireland* for the dairy-farming districts around Wexford and Waterford, the holiday resort of Killarney, and the important cable and meteorological station of Valentia. There are great railway works at Swindon. Other mail steamers run from Penzance to the Scilly Isles and from Weymouth to the Channel Islands, bringing flowers and early fruit and vegetables from the islands in spring and conveying tourists in summer.

The London and North-Western Railway serves the farms of the Midlands, the Black Country, the Potteries, the mining, chemical and textile industries of Cheshire and South Lancashire, the health and holiday resorts of the Lancashire coast, the Lake District and North Wales, the Irish mail traffic via Holyhead and Fleetwood, and the great American trade of Liverpool. Mail steamers cross the Irish Sea from Holyhead to Kingstown and Dublin, where they connect with the Great Southern and Western Railway, which crosses the rich dairy-farming district of the Golden Vale of Limerick and Tipperary en route to Cork Harbour and Queenstown, which are approached by the mountain gap south of Mallow.

Other steamers run from Fleetwood to Belfast, where the *Belfast and Northern Counties Railway* connects with Londonderry and the holiday resorts in the neighbourhood of the Giant's Causeway.

From Carlisle the *Caledonian Railway* continues the " west coast route " across the Southern Uplands by Annandale and Clydesdale to the busy Central Lowlands, continuing from Glasgow by Stirling and Perth through Strathmore to the farming, fishing and granite-quarrying centre of Aberdeen.

The works of the North-Western Railway are at Crewe.

The Great Northern Railway serves the rich agricultural country between London and Lincoln, the coal and iron district of South Yorkshire, and the fertile Vale of York. From York the *North-Eastern Railway* connects with the holiday resorts of the Yorkshire moors and coast, and goes by the Northallerton Gate between the moors and the Pennines to the great coal and iron districts of the Tees, Wear and Tyne, sending an important branch from Newcastle through the Tyne Gap to Carlisle. *The North British Railway* continues the " east coast route " from Berwick by the narrow and historic coast road through Dunbar to Edinburgh. The route passes by the Forth Bridge to the busy mining and fertile agricultural districts of Fife, crosses the Tay Bridge to the busy port of Dundee, with its varied industries, and follows the coast to Aberdeen, whence the *Great North of Scotland Railway* continues through the flat agricultural country to Inverness, the capital of the Highlands.

The Midland Railway serves the farms of the Midlands, the busy industrial regions centred on the coalfields around Leicester, Nottingham and Derby, the coal mines and steel and woollen industries of the West Riding, and the health and holiday resorts of the Peak District, the Pennine Moors and the Lake District.

From Carlisle the *Glasgow and South-Western Railway* traverses the agricultural districts of the south coast of Scotland to Stranraer, the mail-packet station for Larne in the north of Ireland. At Dumfries a line runs up Nithsdale and crosses the mining and woollen manufacturing towns of the Ayrshire coal-field to Glasgow. The *North British* " Waverley route " crosses the Southern Uplands by Liddisdale into the woollen manufacturing district of the Upper Tweed and the famous Scott country, reaching Edinburgh across the Lammermuirs by Gala Water and Eskdale.

The Great Eastern Railway serves the rich wheat lands of East Anglia, the fishing industry of Yarmouth and Lowestoft, the bracing East Coast holiday resorts, and the continental traffic via Harwich to Hook of Holland, Hamburg and Esbjerg.

The Great Central Railway serves the farms and manufacturing districts of the Midlands, the coal-mining and manufacturing districts of South Yorkshire and Lancashire, and the fish and continental traffic via Grimsby (Immingham Docks).

The London and South-Western Railway serves the fertile vales and downland pastures of Wessex, the holiday resorts of the Isle of Wight, Hampshire, Dorset and North Devon, the enormous mail and passenger traffic of the port of Southampton with France, the Channel Islands, South Africa and North and South America, and the important traffic connected with the great military station of Aldershot and the naval dockyards of Portsmouth and Devonport.

The South-Eastern and Chatham Railway carries the agricultural produce of Kent, the holiday traffic to the Kent Coast watering-places, the naval and military traffic connected with Chatham and Woolwich, and the large continental traffic to the "ferry-towns" of Queenborough, Dover and Folkestone, which offer the shortest routes to Holland, Belgium and France. The development of the recently prospected Kent coal-fields between Canterbury and Dover, and the construction of a Channel tunnel would greatly increase the importance of this line.

The London, Brighton and South Coast Railway serves the agricultural country of the Weald, the holiday resorts of the Isle of Wight and the Sussex coast, and the Newhaven-Dieppe route to France.

The Lancashire and Yorkshire Railway runs from Liverpool to Goole, with many branches to the various towns in the cotton and woollen manufacturing districts of South Lancashire and the West Riding.

Motor Road Transport. The perfection within recent years of the internal combustion petrol engine is bringing about a revolution in matters of transport, and the high roads are now almost regaining the relative importance they held in the coaching days of a century ago. For the freedom of action possessed by the motor-driven vehicle compensates for the reduction of speed as compared with the fast locomotive which is restricted to a permanent way; and the unpleasantness of this means of transport to other users of the highways is counterbalanced in part by the improvement in these highways which motor traffic demands and secures, and by the increased facilities for transport that it confers upon the community.

CHAPTER XII

THE BRITISH ISLES (*continued*)

COMMERCE AND SEAPORTS

Excess of Imports—Nature of Imports and Exports—Sites and Trade of the Great Ports.

COMMERCE

THIS is in many respects the greatest industry of the country, and also one of the reasons for the existence of our enormous Empire. Indeed, commerce and empire act and react so closely that it is often difficult to distinguish which is the cause and which the effect in any particular instance. For although the early colonies were simply regarded as places from which various luxuries might be obtained, they later became markets for the products of the manufacturing industry of the mother country, and with the enormous growth of the industrial population of this country, it

has been found necessary to acquire territory in order to establish new markets which should be secure from the danger of native attacks or of foreign competition. For example, we may note the recent acquisition of Egypt for the protection of our commercial interests in the Suez Canal, the most vital link in our communications with India; and India itself became a part of the Empire as a result of commercial competition with France.

The diagrams (Fig. 17), based upon the figures for the year 1913, before the Great War had made its disturbing influence felt, bring out clearly one or two points.

First, there is a considerable excess of the value of the imports over that of the exports. As ultimately exports and imports should pay for each other, the various forms of money being only an intermediate convenience of exchange, it would seem that as a nation we are not paying for all we receive. But the discrepancy in values is accounted for in several ways. In the first place, the import values include cost of freight and insurance of the cargo, while the export values are simply those of the goods at the port of lading. This applies, of course, to any country, but in our own case there are several other items to consider.

1. As a result of our insular position, our large supplies of coal and iron and our own great commerce, we have become the greatest shipbuilders of the world, and control just about half of the total tonnage of merchant ships that sail the seas. Many of our ships are engaged in carrying merchandise for countries less favourably situated, and the payment for these services returns ultimately to this country as imports for which there is no corresponding export in the national balance sheet.

2. Owing to the amount of capital amassed by many years of successful industry due to our many natural advantages, there is a considerable surplus

COMMERCE OF THE UNITED KINGDOM IN 1913

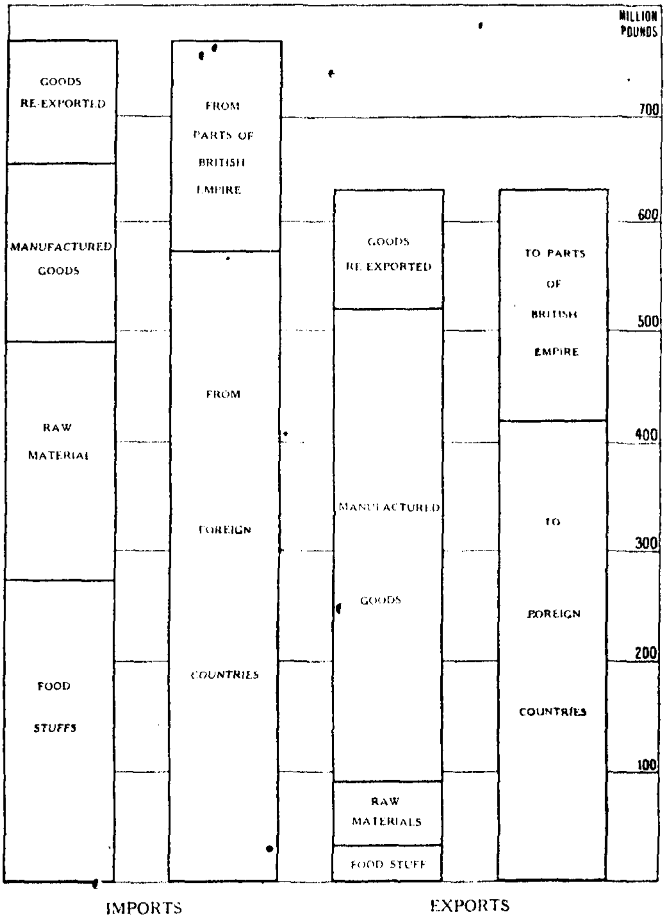


FIG. 17.

for investment abroad in the "newer" countries, which require capital for the development of their

resources. A proportion of our excess of imports is due to dividends on these investments.

3. London, being the greatest banking centre in the world, earns commissions by negotiating foreign financial transactions, and these commissions also swell the imports.

Fig. 17 also shows clearly the preponderance of foodstuffs and raw materials among our imports, and the enormous proportion of our export trade that is due to manufactured articles.

Besides these great imports for home consumption and the export of our own produce, the United Kingdom also has a large *entrepôt* trade, amounting in 1913 to more than 100 million pounds. This consists of articles landed here from our colonies and other countries and then reshipped to their foreign destination; thus wool from Australia may be sent via London to Rotterdam, or tea from India via London and Liverpool to New York.

Our considerable imports of manufactured goods consist of articles that can be manufactured either more cheaply or of finer quality in some foreign country owing to special resources, cheaper labour, or specialisation in some particular industry, *e. g.* chemicals from Germany, silks from France, woodwork from Sweden, and agricultural implements from the United States; all of which countries, of course, buy from us other articles which we can produce better than themselves.

Our exports of foodstuffs consist of highly prepared foods and drinks, and coal makes up three-quarters of our exports of raw materials.

It will be noticed that we draw about a quarter of our supplies from various parts of the Empire, which also purchase about a third of our exports.

The accompanying table shows from which parts of the Empire we obtain supplies of some of the more important foodstuffs and raw materials. These will be more fully dealt with in connection with each

country in turn. One or two facts may be noted in connection with the imports from foreign countries. Our chief foreign sources of *wheat* were the United States (17), Argentina (7) and Russia (6); of *meat*, Argentina (18), Denmark (9) and United States (6); of *sugar*, Germany, Austria, Holland and Belgium; of *cotton*, the United States (50) and Egypt (19); and of *petroleum*, the United States and Russia.

The table also shows the value of the chief types of goods sent out by the mother country in return. For further details see Statistical Appendix, pp. 358-363.

TRADE OF THE MOTHER COUNTRY WITH THE COLONIES IN 1913 IN THE MORE IMPORTANT ARTICLES

(Values in millions of £)

I. IMPORTS

Import from	India	Canada	Australia	South Africa	New Zealand	Other Colonies
Wheat . .	8	11	5	—	—	—
Meat . . .	—	—	7	—	6	1
Tea . . .	8	—	—	—	—	4
Wool . . .	—	—	12	6	8	2
Hides . . .	1	—	3	2	1	1

II. EXPORTS

Export to	India	Canada	Australia	South Africa	New Zealand	Other Colonies
Cotton Goods.	38	4	5	2	1	9
Iron and Steel Goods . .	15	2	10	5	2	6
Woollen Goods	1	5	3	1	1	1

Seaports

This enormous overseas trade is shared by a number of large ports which have grown up at the estuaries of the larger rivers.

London is not only the largest city, but is also the largest seaport according to the shipping entering and leaving its docks. It grew up in olden times at the limit of navigation up the Thames estuary, for there was a ford at Westminster. It was also at the first point up the river where relatively high and dry land approached the water's edge, allowing of the building of a bridge. This bridge-place attracted roads and travellers from the fertile plains on either side, and the river itself was a great road leading to the narrowest part of the narrow seas and the more highly civilised countries on the other side. The exceptionally high tides, caused by the meeting of two tidal waves, one proceeding up the English Channel and another down through the North Sea, helped to clear the estuary of silt and to carry shipping far inland. This factor still counts, but the great difference between high and low water—about twenty feet maximum—makes the provision of docks essential.

Having grown to be the capital when the agricultural south and east was far more important than the modern industrial regions to the north and west, it has been able to maintain its predominance, for railways make it easily accessible from all parts of the country, and add to its importance.

It receives about a third of our total imports, and sends out about a quarter of the exports. The former include wheat and meat from the United States and Argentina, tea from India and Ceylon, coffee from Brazil, beet-sugar from Germany, dairy produce from Holland and Denmark, mutton wool and butter from Australia and New Zealand, timber from Russia, Sweden and Norway, silk from

China and Italy, hides, mohair, gold and diamonds from South Africa, and tin from the Straits Settlements. The exports consist mainly of machinery and textile goods. The advertisement columns of any newspaper will show how many important steamship lines for all parts of the world use London as a terminal port. *Chatham*, in the Medway estuary, is the great naval base for the protection of the commerce of the Port of London and the Narrow Seas.

Liverpool, at the estuary of the Mersey, approaches London in the volume of its trade, receiving a quarter of the imports and sending out a third of the exports of the country. It owes its importance to the great cotton industry of South Lancashire and the great trade in foodstuffs and raw material with America. Its principal imports are cotton from the Southern States, corn and meat from the United States, Canada and Argentina, cattle and dairy produce from Ireland, rubber from Brazil, palm oil from West Africa, copper from Chile and Peru, and wool and tallow from Argentina. It exports cotton goods to the Mediterranean and tropical countries, woollen goods to Canada and the United States, and metal goods and textile machinery to all parts. The great Cunard liners carry the mails to New York in four and a half days, calling at Queenstown on the outward and Fishguard on the homeward journey. The curious-shaped estuary of the Mersey facilitates entry to the port by increasing the scouring action of the tide through the narrow entrance. The construction of the Ship Canal has converted *Manchester* into a seaport with a large share of the trade. *Birkenhead* has shipyards and soap factories.

Cardiff grew up where the old south-coast road between the mountains and the sea crossed the river Taff, and when the fine steam coal and iron were worked higher up the valley its importance was enormously increased. It is now the greatest coal port in the country, and the ships that come for coal

bring foodstuffs for the large industrial centres, and iron, copper and tin ores for the smelting works that have grown up on the coal-field. *Newport* and *Swansea*, at the mouths of the Usk and Tawe respectively, are similarly increasing in importance.

The Tyne Ports, from the head of ocean-going navigation at *Newcastle*, where the river is crossed by the great east coast route to Scotland, down to the sea at *Tynemouth*, are famous for their coal, their ships and machinery. The certainty of outward cargo allows of cheap importation of foodstuffs, such as dairy produce from Denmark and Holland and beet-sugar from Germany, and also of iron ore and pit-props for the mines from Sweden. The estuary has been artificially deepened, and some of the largest Atlantic liners have been built on the Tyne. *Sunderland*, similarly situated at the mouth of the Wear, has a similar trade. *Blyth*, further north, is another coal port with a large export trade.

Southampton, between the estuaries of the Test and the Itchen and at the head of the deep, sheltered harbour of Southampton Water, has always been important. Its tides, too, are specially favourable. High tide, advancing up the Channel from the west, "makes" first in the Solent and then follows up Southampton Water. Two hours later, before the tide has fallen very far, the same tidal current, still advancing up the Channel, sends a branch up Spithead, and thus prolongs the period of high water in the port. It also prevents the occurrence of very low tides, and in these days of large ships this gives the port a decided advantage over London. Even if big ships go round into the Thames their cargoes must be unloaded at Tilbury and sent on by rail; so the enormous White Star liners carrying mail, passenger and general traffic to New York use Southampton rather than London, and the great liners of the North German Lloyd and Hamburg-America Lines also put in at the port. It is also the terminal

port of the Union Castle Line, which carries the mails to South Africa. *Portsmouth*, on a fine harbour,

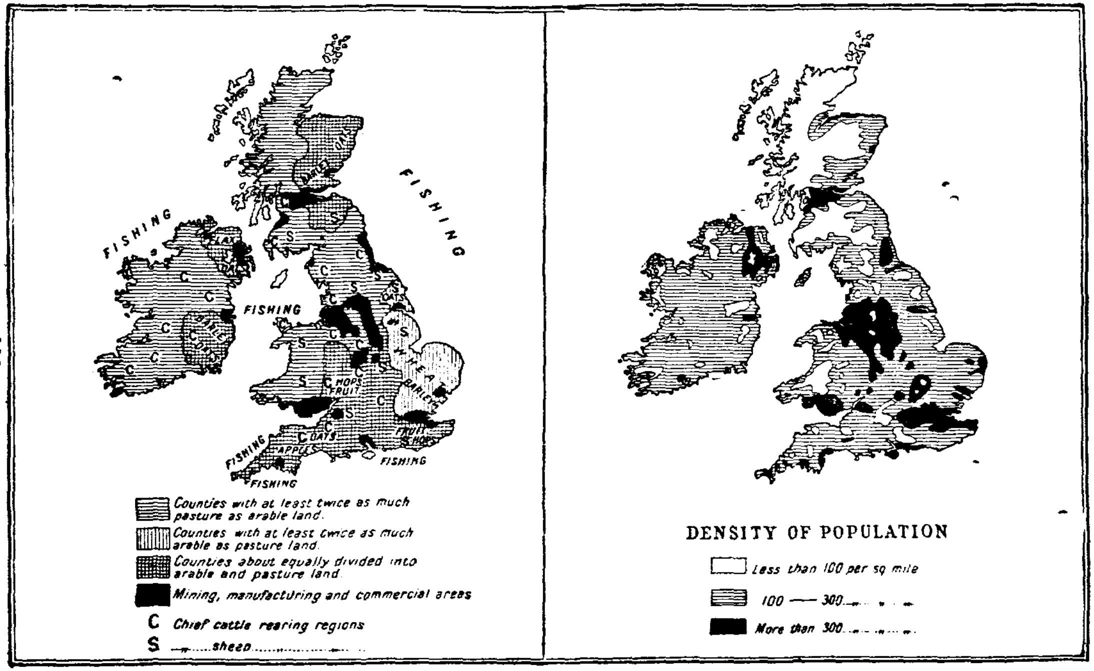
FIG. 18.

became a Government dockyard in the days of wooden ships, when the greatest naval menace lay across the Channel; and the good start it had obtained has

enabled it to keep its position, although changes of shipbuilding material and strategic considerations have built up other rivals.

The Humber Ports, of which *Hull* is by far the most important, followed by *Grimsby* and *Goole*, do a large trade. The estuary forms a good harbour, the hinderland is very productive both agriculturally and industrially and is thickly peopled, and there is easy communication by river, canal and railway in all directions. It is on the shortest line of communication with the estuaries of the Elbe and Weser, and with the Baltic Sea via the Kiel Canal, and within easy reach of the fisheries of the Dogger Bank. The cooler countries of Northern Europe are the best foreign markets for the woollen goods of the West Riding; Sweden supplies the best steel for the cutlery industry of Sheffield, and pit-props for use in the largest of our coal-fields. Dairy produce to supplement local supplies is obtained from Denmark and Holland. The Humber ports are admirably situated for all these branches of commerce, and the recent successful venture to open up the trade of Siberia via the Kara Sea and the Yenisei in the summer months set out from and returned to Hull.

Glasgow and the Clyde Ports became important with the introduction of sugar and tobacco from the West Indies, and still retain industries in connection with these articles; but they have grown much more important with the development of iron, textile and shipbuilding industries based on the wealth of the Lanarkshire coal-field, and by the foresight of the people in artificially deepening the Clyde estuary. The Clyde shipyards turn out about a quarter of the total annual tonnage of British shipbuilding, both naval and mercantile, far exceeding the output of all the shipyards of the United States together, and almost equal to the total output of Germany. The hinderland of Glasgow is not only busy industrially, but is also the most fertile land in Scotland and the


FISHING
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OATS
BARLEY
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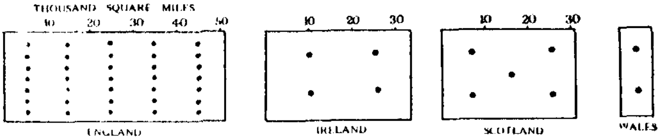
S
OATS
WHEAT
BARLEY
HOPS
FRUIT
FRUIT
& HOPS
OATS
APPLES
Counties with at least twice as much pasture as arable land.
Counties with at least twice as much arable as pasture land.
Counties about equally divided into arable and pasture land.
Mining, manufacturing and commercial areas
C Chief cattle rearing regions
S ——sheep——
DENSITY OF POPULATION
Less than 100 per sq mile
100 —— 300
More than 300

this can be seen by considering, for example, the number of people that would live on, say, a square mile of country; first, if it were simply used for grazing; then, if it were ploughed up and planted with crops, and, lastly, if one or more factories were built upon it. In the first case, one or two men and their families could do all the work required in tending the flocks; in the second, perhaps, some twenty families would find employment, establishing a small village; while in the last case several hundreds of men might be employed, and they and their families would live in the neighbourhood of the factories, giving rise to a town.

DENSITY OF POPULATION



Areas of countries proportional to the rectangles
Each dot represents 1 million people at 1911 census

Fig. 20.

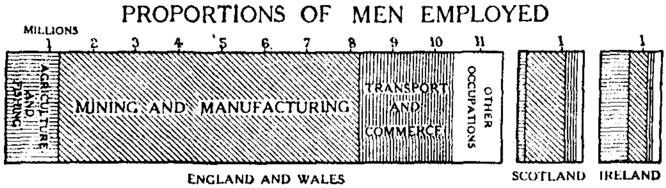
Of all the densely peopled areas, that around London is the only one where the presence of a coal-field has not been a determining factor; but owing to the natural advantages that fixed it as the capital of the country, and the magnificent artificial means of communication that have been focussed upon it as a result, raw materials for manufactures are most easily gathered together there; and, as the commercial and political capital of the Empire, it has become the home of no less than one person out of every five in England and Wales.

In England and Wales there are 100 large towns each with more than 50,000 people, and containing between them just about half of the total population.

In Scotland the counties of the Central Lowlands, which are the most productive, both agriculturally

and industrially, contain three-fourths of the total population of the country; the two cities of Glasgow and Edinburgh together accounting for one-fourth. There are several other large towns.

Ireland has only three large towns—Belfast, Dublin and Cork, and, being mainly concerned with farming owing to its lack of minerals, has its population more evenly distributed than either of the sister countries.



Numbers of Men employed in various types of industry

FIG. 21.

Many British agriculturists finding farming somewhat unprofitable, and many of the industrial population finding town life uncongenial, now emigrate to the colonies, particularly Canada, Australia and New Zealand, or to the United States of America, which countries, with great resources and relatively small populations, offer great opportunities to capable and industrious settlers. In the last fifty years some 13 million have emigrated from the mother country, about a half of them going from England and Wales and a third from Ireland. This enormous proportion relatively to the total population of Ireland has led to an absolute decline of the population of that country, which is now only two-thirds of what it was fifty years ago, while the population of Great Britain has almost doubled in the same period.

CHAPTER XIV

BRITISH POSSESSIONS IN THE MEDITERRANEAN

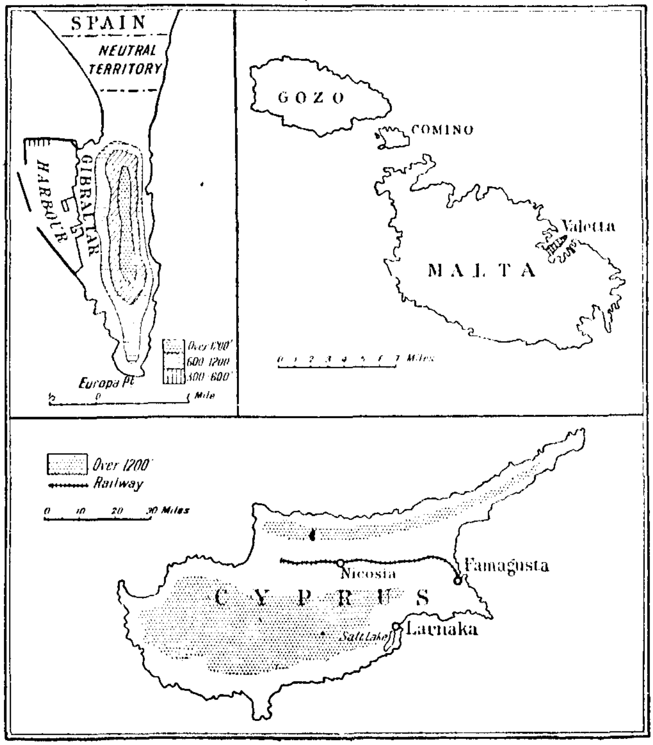
Gibraltar—Malta—Cyprus.

Gibraltar is one of the strongest links in the material chain that binds the Empire together, for it and the fleet that uses it as a base control the commercial highway that ranks second only to the North Atlantic in the volume of its trade. Physically it is just a limestone rock three miles long from north to south, three-quarters of a mile wide and a quarter of a mile high, descending precipitately to the sea in the east and south. On a narrow strip along the west, facing the bay of Algeciras, the garrison and dockyard and homes of those employed there have been built. On the north side it drops steeply to the very low and narrow isthmus that joins it to the mainland, and is regarded as neutral territory between Great Britain and Spain. The rock is honeycombed with batteries carrying the most modern heavy artillery, which control the approaches in every direction and the fourteen miles of sea that here separate Europe from Africa. The bay to the west of the rock is a magnificent harbour, which has been improved by the construction of moles, commercial wharves and naval docks where all repairs can be carried out. Enormous stores of coal and provisions are always kept in reserve.

The climate is typical of the Mediterranean, the summer being hot and droughty and the winter mild with considerable rainfall. The porous nature of the rock leads to an absence of springs and streams, and the supply of fresh water is a difficulty. Each house has a tank to catch rain-water from the roof, and artificial "catchments" have been prepared on parts of the rock slope to fill large reservoirs.

Machinery for the distillation of sea-water in time of need has also been installed.

The rock is unproductive and has no exports, its



BRITISH POSSESSIONS IN THE MEDITERRANEAN.

FIG. 22.

maintenance being an Imperial charge justified by the security it gives to Imperial trade. Some six million tons of shipping enter and leave the port annually, two-thirds of which is British. It has

cable connection and a daily postal service with Great Britain and cable connection with all important ports of the Mediterranean.

The population, including the garrison of 5000 men, numbers about 24,000, and the Commander-in-Chief is the Governor of the colony.

Malta, another important naval and military station, commands the passages between the eastern and western basins of the Mediterranean. From its situation it has always been important, and in the course of history has been possessed or fought for by Phœnicians, Greeks, Carthaginians, Romans, Arabs, Normans, Turks, French and British. For not only has it a commanding situation, but it is fertile and productive, and has a magnificent harbour now known as the fortified dockyard and coaling-station of Valetta.

The island is low, nowhere rising to 800 ft., and mainly composed of limestone covered with a thin layer of very fertile soil. There are no permanent streams in the island, and drinking-water is obtained from wells dug through the porous limestone.

The summers are very hot and dry, and the mean annual rainfall of the island is about 20 in., most of which falls in the winter months, which are as warm as an English summer. Cereals, grapes, figs and oranges ripen splendidly in the hot summer, and in the mild winters beautiful flowers and abundant crops of vegetables and green food for animals can be grown. A little cotton is also cultivated. Early potatoes, fruit and honey, find their way to the English market. Owing to the summer drought, the high winds and the keeping of large numbers of goats, which browse on young shoots, trees are very scarce. There has also been careless destruction of the trees by man in past years, for fuel and building purposes.

Few cattle are kept, as the pastures are too poor in summer; but large numbers of goats and sheep

are reared, the former supplying most of the milk. Donkeys and mules do most of the transport work.

Although the island is only about two-thirds the size of the Isle of Wight, it has nearly three times as many people, and large quantities of grain and meat are imported to make up for local deficiencies. The largest item of both export and import is, however, coal, which shows the most important function of the island in its relation to the outside world; over five million tons of shipping entering and leaving its ports each year.

The Crown Colony of Malta also includes the smaller neighbouring islands of Gozo and Comino.

Cyprus, although much larger than Gibraltar and Malta, is not so important commercially or strategically, for it lies off the main stream of modern commerce through the Mediterranean. Like Malta, however, it has been a bone of contention between all the great Powers that have held sway over the Levant at various times in the course of history, and the island is famous for the many relics of prehistoric man that have been unearthed there from time to time.

Physically the island consists of two parallel mountain ridges traversing the island from east to west along the northern and southern coasts, and enclosing between them the fertile plain of the Mesaoria. Owing to the scanty rainfall and porous rocks there are no permanent streams or rivers, but there are a few salt lakes along the southern shores, which yield valuable quantities of salt by natural evaporation during the summer droughts. Its climate is similar to that of Malta, but hotter and drier owing to its greater size, its nearness to the continental masses and its distance from the open ocean. This, in addition to the reasons already noted in the case of Malta, makes almost a complete absence of trees except the small dark-green olive and *carob trees*. The latter produce large seed-pods

(known in this country as "locusts"), which are hard and black when ripe, but are quite edible. They constitute over a third of the total exports of Cyprus, and are mainly used in making cattle food. Real locusts used to do much damage to green crops in Cyprus, but the pest has now been largely overcome. Good crops of *wheat* and *barley* are raised, but primitive methods of threshing spoil the market value of the products. *Grapes*, too, are largely grown, and *raisins* and *wine* are exported. *Cotton* and *maize* are grown under irrigation in the summer, and the mulberry is cultivated to feed *silkworms*. Cotton and silk cocoons are among the exports.

Cyprus was known to the Phœnicians of Tyre and Sidon as a source of *copper*, and, indeed, the metal received its ancient name (cuprum) from the island (Cyprium). Attempts are now being made to open up the old workings by more scientific methods, and to tap new sources of the mineral. Gypsum, marble and asbestos are also worked. A kind of cuttle-fish caught off the coast yielded the purple dye for which the Phœnicians were famous, and *sponge* fisheries are still carried on.

The population and commerce of the island are small relatively to its resources, three centuries of Turkish neglect and misrule of it and the neighbouring mainland having had a very bad effect upon it. But with the establishment of settled government, putting in hand irrigation, railway and harbour works, it has considerable possibilities for the future.

The chief port is *Famagusta*, at the eastern end of the central plain and facing the Syrian coast. A railway of about sixty miles traverses the plain to *Nicosia*, the capital, and beyond. The island, nearly as large as Wales, has less than 300,000 people, or only a few more than Malta.

PART III

ASIATIC POSSESSIONS

CHAPTER XV

INDIA

ROUTES TO INDIA—ANCIENT AND MODERN

ECONOMIC relations between Western Europe and India may be roughly divided into three periods: the Venetian Period, which lasted through the Middle Ages down to the end of the fifteenth century; the Cape Period, lasting till 1870; and the modern or Suez Canal Period. In the first, the trade was almost entirely in the hands of the "Merchants of Venice," whose ships crossed the Mediterranean Sea to Alexandria, Beirut and other Levantine Ports. Here they were met by camel caravans which had crossed the deserts laden with silks, jewels, spices and other luxuries from "farthest Ind." These caravans came either across the desert of Lower Egypt and the Nile from Suez, where the treasures had been landed by ships that had traversed the Arabian Sea, the Strait of Bab-el-Mandeb and the Red Sea; or they came through Mesopotamia and across the Syrian Desert via Damascus or Aleppo from Basra on the Shatt-el-Arab, whence ships traded with India through the Persian Gulf and the Strait of Ormuz. The Venetians traded with Western Europe either by sea or across the Alpine Passes to the valleys of the Rhine and Rhone.

The rounding of the Cape of Good Hope by Bartholomew Diaz, a Portuguese, followed by his fellow-

countryman, Vasco da Gama, who in 1498 reached Calicut in Southern India by this route, gave a death-blow to Venetian trade, and for some years the trade with India became a monopoly of the Portuguese seamen. Goa and one or two smaller ports on the west coast still remain in the possession of Portugal and remind us of this period. But the monopoly was soon challenged by Dutch, French and British seamen, who also established trading-stations on the coasts, carrying on the trade by the Cape Route.

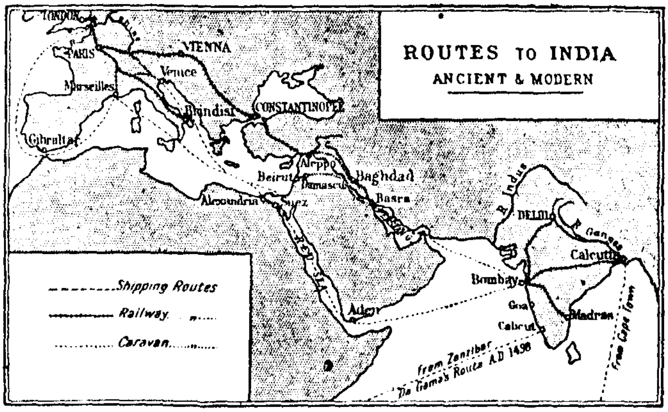


FIG. 23.

The British "East India Company," founded in 1600 to carry on this trade, set up stations on the present sites of Calcutta, Madras and Bombay, and eventually became very powerful politically as well as commercially. Quarrels with the French traders and with native princes led eventually to the acquisition of the control of almost the whole country by the British Government, but Pondicherry and a few other small ports are still held by the French, and many native rulers continue to govern their own states subject to a more or less nominal British control.

The opening of the Suez Canal in 1869 reduced the sea voyage to India by 4000 miles, and the Mediterranean has once more become a great highway for Indian commerce. But in the long interval between the Venetian Period and that date, Italian commerce had declined so greatly with the growth of the Atlantic countries that, although the trade of Venice has experienced a revival, it is not now even so great as that of Marseilles or Genoa, and cannot be compared with the trade of London, Antwerp, Hamburg or Rotterdam.

The quickest mail and passenger route from Great Britain to India is now via Dover and Calais, thence by the Paris, Lyons and Mediterranean Railway, via the Mont Cenis Tunnel through the Alps, to Turin, after which the railway crosses the Plain of Lombardy and follows the east coast of Italy to Brindisi. A steamer here runs to Port Said, making connection with the mail boat of the Peninsular and Oriental Steamship Company, which has come from Tilbury via Gibraltar, Marseilles and the Strait of Messina. After taking on board coal, which has probably come all the way from South Wales in a collier and which is transferred to the liner by swarms of Asiatic porters, the vessel proceeds through the Suez Canal and Red Sea and reaches Bombay three weeks after leaving London. The "overland route" described above saves ten days of this time.

In future, if peace is ever finally restored in the countries of the "Middle East," the great Orient Express Route from Paris to Constantinople may be linked with the projected Baghdad Railway to the Persian Gulf, whence a line along the coast would complete practically a straight line of direct railway communication from the Strait of Dover to India, a distance of only 3500 miles, or little more than half the distance by the sea route. This would bring London within a week's journey of India.

CHAPTER XVI

INDIA (*continued*)

PHYSICAL FEATURES AND CLIMATE

The Himalaya—The North-West Frontier—The Great Plain and Rivers—The Deccan—The Monsoons—Drought and Irrigation.

INDIA can easily be divided into several distinct physical regions.

1. *The great mountain wall of the Himalaya.* This is a natural barrier 1500 miles long, 150 miles wide and four miles high separating the plains of India from the plateaus of Central Asia. Several peaks are even five miles above sea-level, and Mount Everest, the highest peak in the world, is almost six. This barrier is an obstacle to hostile invasion, to cold winds, and to peaceful commercial intercourse; the trade carried on by caravans of yaks, the only animals able to endure the cold and rarefied atmosphere of the lofty passes, being almost insignificant.

Owing to their great height the mountains are, of course, snowcapped, the snowcap alone of Mount Everest being as large as the whole of Mont Blanc. Indeed, the name Himalaya means "the abode of snow," for such it is to the Hindus living on the sunburnt plains, who see the glistening peaks high above the dark-green forests that clothe the lower slopes. The glaciers that fill the high valleys keep ever full the huge rivers that bring water and fertility to the plains even in the dry seasons. The Indus and the San-po, or Brahmaputra, rising in Lake Manasarowar in the middle of the great trench behind the mountain ridge, flow west and east respectively for hundreds of miles before breaking through to the plains below, and the Ganges and its tributaries gather up the enormous rainfall and melting snow from the southern flank.

2. *The tangled mountain region of Baluchistan and the North-West Frontier.* This is a region of high and arid mountain ridges with isolated valleys inhabited by fierce and independent tribesmen; but it contains several relatively low passes, through which is carried on by caravans of mules and camels a small trade with Persia and Afghanistan. Through these passes also have come successive land invasions of India from Central and South-Western Asia. The best known of the passes are (*a*) the Khaibar, south of and parallel to the rocky gorge of the Kabul River and guarded by the British garrison at Peshawar, and (*b*) the Bolan, guarded by the fortress of Quetta. A railway traverses this pass to Chaman on the Afghan Frontier.

3. *The parallel mountain ridges and valleys of Burma.* The heavy rainfall of this region clothes the mountains with forests of valuable timber and supplies the great rivers Irawadi and Salwen, which are the fertilisers and the commercial highways of the country. The north-and-south trend of the valleys has facilitated invasions from China, and the inhabitants are mainly of the yellow Mongolian type.

4. *The plain of the Indus and the Ganges.* This consists of a depression between the mountains previously considered and the Deccan Plateau of Southern India, and has been filled with fertile alluvial soil washed down by the great rivers in past ages from the surrounding highlands. With the magnificent water-supply of the rivers, and also the large underground supplies that can be tapped by means of wells, this has become the most densely peopled part of the country, and contains almost a half of the total population of 315 millions, who regard the rivers as sacred. From the nature of its formation, road-building material is scarce and the roads are thick with either dust or mud according to the season. But the lowness of the plain has

allowed of the construction of a network of canals and railways to supplement the excellent communications afforded by the rivers, more especially the Ganges and its tributaries, the Gogra and the Jumna. India took its name from the Indus, meaning "the great water"; so called by early invaders from the arid mountain regions of the north-west, who were strongly impressed by the noble river discovered soon after their descent on to the plain. This plain, stretching

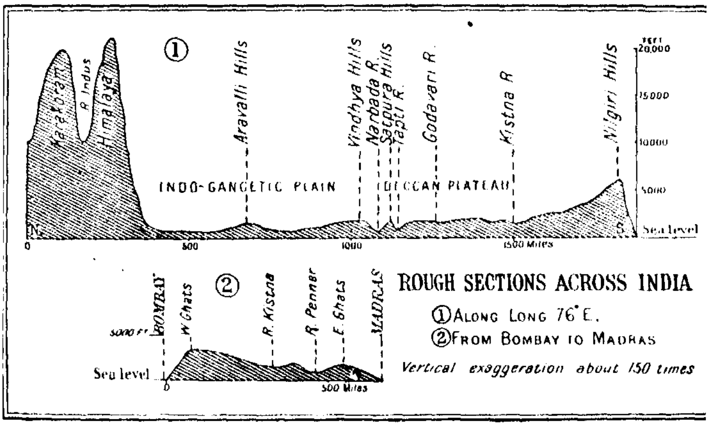


FIG. 24.

some 1500 miles from Karachi to Calcutta, with an average width of 200 miles, nowhere rises to 1000 ft.; the ridge at Delhi, dividing the two great river basins, being only a little over 600 ft. above sea-level.

5. *The Deccan Plateau.* This peninsular portion of southern India has an average height of 2000 ft. above sea-level, and, as is shown by the direction of most of the rivers crossing it, slopes from west to east. The high western edge presents a steep front to the Arabian Sea, and the name "Ghats" applied

to it indicates that it descends to the coast in "steps," similar to, though much steeper and narrower than, the karroos in South Africa. The Eastern Ghats are much lower and more broken. The Deccan rivers, like most rivers in plateau regions, flow in deep gorges and are therefore of little value for either irrigation or communication, and it will be seen that there is no town of any size or importance on any of the Deccan rivers.

A crustal disturbance has changed the direction of tilt of the northern portion of the plateau, and the parallel Narbada and Tapti rivers flow to the Arabian Sea. The basaltic rock, which has weathered to a fine black soil most suitable for cotton growing in this district, indicates that this region has experienced volcanic activity in earlier times. The Upper Narbada and Lower Tapti valleys are traversed by railways from Bombay and Surat to the Ganges Valley. The high northern edge of the plateau supplies with water the southern tributaries of the Ganges, notably the Chambal and the Son.

The high Western Ghats prohibited access from the west coast to the interior, and deferred the progress of Bombay by restricting its hinderland, until modern British railway engineering had overcome this natural obstacle, by constructing zigzag tracks over the Thal Ghat and the Bhor Ghat Passes at a height of 2000 ft., leading to Calcutta and Madras respectively.

The highest portion of the plateau is in the extreme south, where the Nilgiri and Cardamom Hills rise to almost 9000 ft., but, curiously, between them lies the lowest pass across the Ghats—the Palghat, which is little more than 1000 ft., or about the same height as the Shap summit in England. This pass carries the railway from Calicut to Madras.

6. *The Coastal Plains.* The west coastal plain confined between the high Western Ghats and the sea is very narrow, and the rivers crossing it are

consequently short, swift and unnavigable. On the east the plain is wider, and the deltas of the Deccan rivers are well irrigated, productive and well peopled.

Climate. In the lowlands the *temperature* is always high, and even in the extreme north winter temperatures are about equal to those of an English summer, wheat being reaped in January. As the greater part of the country lies inside the tropics, it is intensely hot in summer, when the sun is never far from the zenith at mid-day. At this season Europeans find the heat in the plains unbearable and retire to the cooler hill-stations of Simla, Darjeeling, Poona, etc. A climate like this necessitates the lightest possible clothing, and accounts for the enormous importation of Lancashire cotton goods, and partially for the recent establishment of cotton-mills in the country.

The distribution of *rainfall* in India is determined by the monsoons, or seasonal winds. In summer the great land mass to the north of India becomes intensely heated, and the air above it is consequently hot and light. The relatively cooler and heavier air over the Indian Ocean to the south then moves towards the land, and, owing to the rotation of the earth, does so from a south-westerly direction. Owing to the great evaporation going on at this season, the South-West Monsoon is heavily charged with moisture, and, when cooled by ascending the Western Ghats and the mountains of Burma and Assam, deposits it in downpours of rain. But it often passes over the heated lowlands of the Lower Indus Valley and the Thar Desert without depositing a drop. The monsoon is deflected up the Ganges Valley by the wall of the Himalaya, and carries abundant rain to most of that region. *This rainy season lasts from about June till October.* By this time the land mass to the north has cooled down, and, during the winter months, the cooler and heavier air over the land blows out from a north-easterly direc-

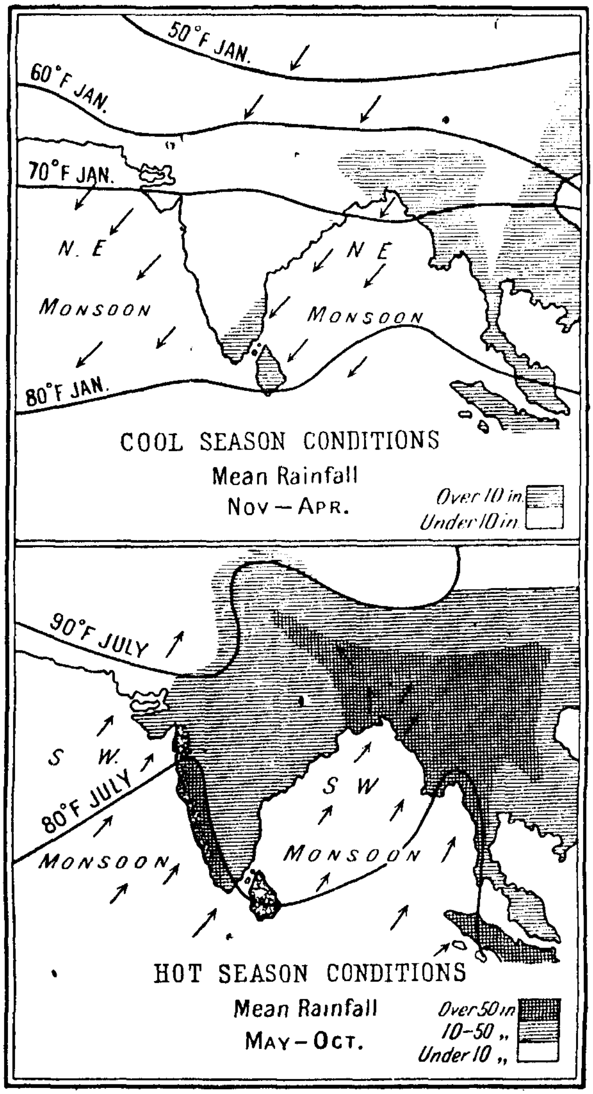

50°F JAN.
60°F JAN.
70°F JAN.
80°F JAN.
N. E
MONSOON
N E
MONSOON
COOL SEASON CONDITIONS
Mean Rainfall
Nov – Apr.
Over 10 in.
Under 10 in.
90°F JULY
80°F JULY
S W.
MONSOON
S W
MONSOON
HOT SEASON CONDITIONS
Mean Rainfall
May – Oct.
Over 50 in.
10–50 „
Under 10 „

Fig. 25.

tion towards the warmer sea. A glance at the map will show that this North-East Monsoon will be dry for most of India, but the moisture picked up in crossing the Bay of Bengal is deposited on the slopes of the Eastern Ghats in the south-east corner, and Madras gets most of its rainfall in October and November. For Northern India, however, *from November to February is a comparatively cool, dry season. From March to May the country becomes intensely hot and parched* till the South-West Monsoon "bursts" once more. During the changing of the monsoons violent whirling storms or cyclones sweep the Indian seas, doing much damage.

Although the great heat and moisture of the Indian summer allow of the growth of abundant crops of rice and millet, the staple foods of the people, the climate is not without its drawbacks. There can be no doubt it is an important factor in causing the deaths of the half-million natives who die each year of plague and fevers; and the periodical failure of the wet monsoon, or the coming of too much rain at one period followed by a long drought has accounted for millions of deaths through famine in past years. One of the best things British government has done for India is the regulation of the water-supply by the construction of enormous irrigation works, notably the construction of "tanks," by damming river valleys and converting them into lakes which act as reservoirs, saving the land from destructive floods in the wet season and the population from devastating famines in the droughts. These "tanks" are of the greatest importance in the Madras Presidency, where the whole rainfall for the year often comes in a few weeks.

In the valleys of the great rivers and along the east coastal plain some 50,000 miles of *irrigation canals* have been constructed to carry off surplus water to where it may be of more use; and the Ganges Basin between the Jumna and the Gogra

tributaries is riddled with *wells* that tap underground streams of water. By these means some 23 million acres have been brought under cultivation. The natives are not the only gainers by this work, for the Government now draws an annual revenue of about £4,000,000 from these lands, representing nearly 10 per cent. on the capital cost.

CHAPTER XVII

INDIA (*continued*)

INDUSTRIES AND PRODUCTIONS

Forestry—Pastoral Industry—Agriculture—Famines and Relief Works—Mining—Manufactures.

NEARLY a quarter of a million square miles of land are under the control of the State Forest Department, about half the total being in Burma, and large areas also in Assam, the Central Provinces and Madras. The forest officers of the Government see that the felling is carefully carried out, and that new trees are planted to replace the old. The most valuable timber tree is *teak*, which is felled on the hill slopes of Burma and floated down the Irawadi to the saw-mills at Rangoon, where it is prepared for export. Trained elephants are used in the timber yards. The *sal* is a timber tree of the drier regions, and valuable *cedars, oaks* and *coniferous trees* flourish at different heights on the Himalaya. Teak is both hard and durable, and as it contains an oil which prevents iron from rusting it is largely used in the building of railway carriages and ships.

Bamboo, really an enormous grass, flourishes in the hot, wet lowlands, and is extensively used in building and the making of utensils. *Cutch*, a resin,

and *myrobalans,* the fruit, of certain Indian trees are used in tanning. The fruit of the *mango* is largely eaten by the natives.

The tropical jungle of the Deccan river valleys and of the Terai Swamp at the foot of the Himalaya harbour the tiger and other big game, and are infested with poisonous snakes which kill off large numbers of Hindus every year.

Some of the trees exude a sort of resin called *lac* which is collected and exported for use in making shellac, varnish, and sealing-wax.

Fishing is relatively unimportant, the warm waters of tropical seas not abounding in edible species of fish. The pearl fisheries of the Gulf of Manar and Palk Strait are valuable.

Pastoral Industry

Cattle are kept in most parts to supply milk and to be used as beasts of burden. Religious scruples prevent the natives killing them for food. They are reared in largest numbers on the dry grass lands around the Thar Desert, where rainfall is insufficient for cultivation and irrigation is impossible. The presence of salt in the soil, preserved owing to the scarcity of rainfall in this district, is said to be favourable. Hides and skins form a valuable export. In the wetter lowlands of the Ganges Valley and the east coast many *buffaloes*—small horned creatures quite unlike the bison of North America—are used in ploughing the rice-fields. Large herds of *goats* are kept on the dry hills of the north-west, and from the silken *mohair* obtained from them the famous Kashmir shawls are made.

Sheep are kept on the Eastern Ghats and in the Punjab and Kashmir, and some two million pounds' worth of wool is exported annually.

Mules and Camels are reared in the semi-desert districts of Rajputana and Sind, and are used as

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pack animals in carrying on the trade across the North-West Frontier.

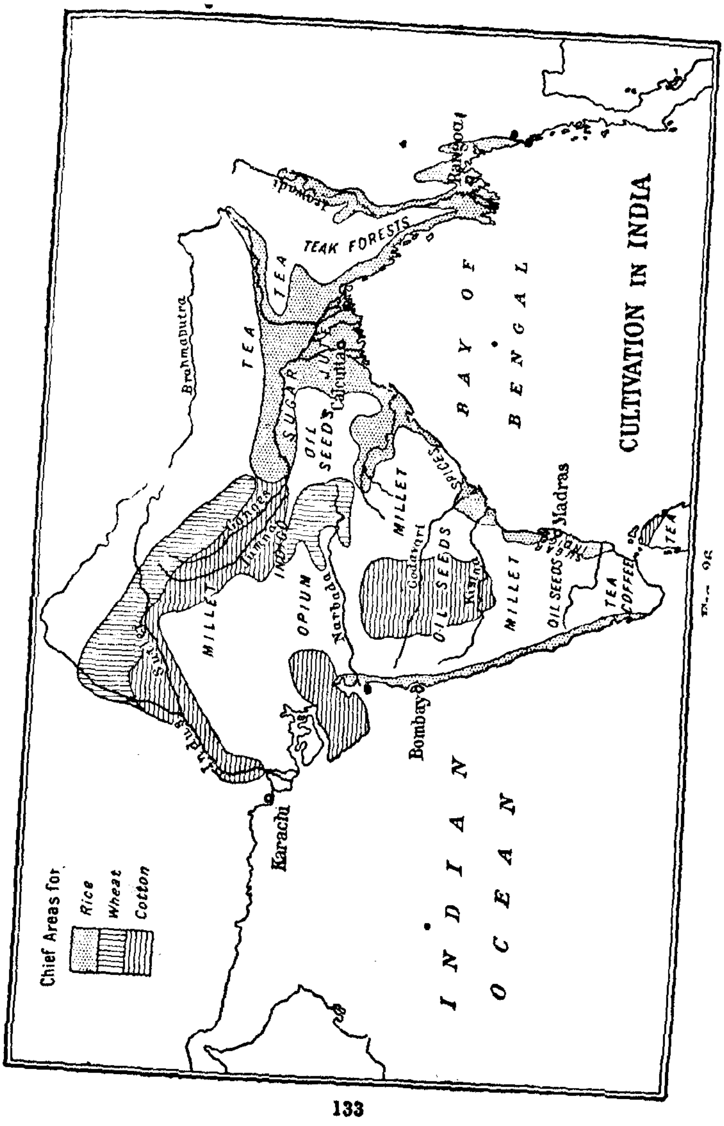
Yaks—a sort of woolly bullocks—are reared in the high Himalayan regions for the caravan trade across the high mountain passes into Thibet.

AGRICULTURE

This is the great industry of the country, two-thirds of the total population being directly dependent upon it, and a quarter of the total revenue being derived from the land tax. Millions of poor ryots, or small farmers, cultivate areas of about five acres each. The hot climate and religious scruples make the people vegetarians, and by far the largest areas are sown with food crops, particularly rice and millet. Partial failure of the rains in summer means privation, if not starvation, to thousands, and the mitigation of the effects of these famines is one of the great problems of the British Government in India. Methods of regulating the water-supply by the construction of canals, wells and tanks have been described in the previous chapter, and the construction of railways has enabled relief to be brought to stricken areas from better-favoured localities; for a famine has never been known over the whole country in the same year. Famine-stricken peasants are relieved by the Government, and in return they construct new irrigation works which will help to minimise the effects of the next visitation.

The particular crops will be considered in the order of the area devoted to their cultivation.

Rice is not only the chief food grain, but also the most valuable export of India. It is cultivated in the lowland regions, which besides being hot have abundant rainfall or can easily be flooded by irrigation; for the crop grows best in water, and the padi-fields are only drained dry just before the grain is ready to ripen. Two crops can usually be obtained


CULTIVATION IN INDIA
Chief Areas for
Rice
Wheat
Cotton
INDIAN OCEAN
BAY OF BENGAL
Karachi
Bombay
Madras
Calcutta
Rangoon
Brahmaputra
Ganges
Jumna
Indus
Narbada
Godavari
Kistna
TEA
SUGAR
JUTE
OIL SEEDS
MILLET
OPIUM
INDIGO
SPICES
COFFEE
TEAK FORESTS

in a year. The well-irrigated Ganges Valley, the deltas of the Deccan rivers and the river valleys of Burma are the chief rice-growing regions. Most of that grown in the former districts is consumed locally, but the bulk of the produce of Burma, which is not so densely peopled, is exported from Rangoon.

Millet, the second food staple of India, while needing abundant heat and moisture, does not require flooding, and is cultivated in the higher parts of the plains and in the Deccan. Very little is exported.

Wheat is grown as a *winter crop* in the drier parts, especially in the Punjab—the land of the five rivers. It is planted at the end of the summer rains and reaped from January to March, thus coming into the English market when the crops of Europe and North America are getting exhausted. Multan is the great collecting centre from which it is sent by rail to Karachi for export. Wheat is also grown in the Upper Ganges Valley and exported from Calcutta, and on the drier northern part of the Deccan, whence it is sent to Bombay. India ranks after the United States and Canada as a source of British wheat supplies.

Cotton is the fibre obtained from the seed-pod of a plant which flourishes in most parts of India where the rainfall is sufficient but not excessive. It is cultivated in the northern plains from Allahabad to Lahore and from Lahore to Hyderabad. But the finest in quality and quantity comes from the rich black disintegrated volcanic soil of the northern Deccan, the ability of the soil to retain moisture even in the dry season being very advantageous. Bombay is consequently much the greatest exporter of raw cotton, but Karachi and Madras share the trade, which is second only to rice in point of value.

Oil Seeds, including linseed, rape, mustard, castor-oil and sesamum, are very largely cultivated. They are used for food, and the oil expressed from them is used for lighting and for outward application.

They are grown as cool-season crops in the rice areas, and also on the Deccan. They form a large item of the export trade of each of the great ports, and are used in Western Europe in the soap industry and for making lubricating oils.

Jute is the fibre obtained by stripping the slender stems of a plant that grows to a height of about ten feet. Practically the only part of the world where it is grown is the Sundarbans or joint delta of the Ganges and Brahmaputra rivers, the alluvial soil and flooding suiting its growth. Its main use is in the manufacture of gunny-sacks used for packing cotton, coffee, sugar, etc. Large quantities of jute are exported from Calcutta to Dundee, where it is used in making sacking and sailcloth, and also for mixing with linen and silk fibres to make more costly fabrics.

Sugar Cane is extensively cultivated in the Lower Ganges Valley, and sugar is also extracted from a species of palm grown along the east coast; but the production is not nearly sufficient for home consumption. Thus, although small quantities of the cane-sugar are exported, much larger quantities of beet-sugar are imported from Western and Central Europe.

Tea is a valuable Indian crop and supplies over half of the British demand. It flourishes on the hill slopes of Assam, the Eastern Himalaya near Darjeeling, and the Nilgiris. In all these regions there are to be found the favourable conditions of great heat, heavy rainfall and good drainage, and the additional advantage of abundant supplies of cheap hand labour, without which tea-planting cannot be carried on at a profit. A lowland variety of tea is cultivated along the Lower Brahmaputra Valley.

Indigo is a blue dye extracted from the stems of a plant grown chiefly in the Ganges Valley and around Madras. Its cultivation is declining owing to the increasing use of cheaper chemical dyes obtained from coal-tar.

Opium is a drug extracted from the seed-pod of the opium poppy, which has been chiefly cultivated on the Malwa Plateau to the south of Agra. Its manufacture is a State monoply and a source of revenue. By arrangement with the Chinese Government, whose people are the chief consumers of the drug, the quantity exported is being gradually reduced to nothing.

Coffee, a plant which flourishes best in hot, wet regions at an elevation of some 3000 ft., is chiefly cultivated on the Nilgiri Hills.

Cinchona, from the bark of which quinine, a remedy for tropical malaria and other fevers, is extracted, was introduced into India from Peru, and is now grown on the Himalaya and the Nilgiris, often being cultivated to protect tea plantations from destructive winds, as well as for its bark.

Pepper and other spices, required to add flavour and digestibility to the common rice dietary, are cultivated along the low, hot and wet east-coast plain.

Tobacco is grown in many parts of the country.

Coconut palms flourish by the seashore in the south of the country, and give rise to small exports of *copra*, the dried kernel of the nuts from which oil can be extracted, *coconut oil* used in the manufacture of soap and margarine and for lubricating, and *coir*, the fibre surrounding the nut, which is used for making matting.

MINING

In India this is a relatively unimportant industry, employing only half a million people in 1912, the total value of all minerals produced being only nine million pounds. Owing to the climate, and perhaps to his few needs, the Indian miner is indolent, and the output of the mines is probably much less than it might be under different circumstances.

Coal made up rather more than a quarter of the total. The chief fields lie along a semicircle passing

through the headwaters of the Damodar, Son, Mahanadi and Godavari rivers; the most valuable being around Raniganj some 100 miles north-west of Calcutta. These supply fuel for the railways connecting Calcutta and Bombay and for smelting iron ore found in the same district. Smaller fields have been opened up in Assam, the Punjab and Upper Burma.

Gold exceeding two million pounds in value was mined in Mysore in 1912.

Petroleum is found in small quantities in the Punjab and Assam, but the richest wells are in Central Burma.

Manganese ores used in the manufacture of steel are mined near Nagpur in the Deccan.

Salt, of the greatest importance in a hot country, is mined in the Salt Range of the Punjab, and obtained by the evaporation of sea-water along the coasts and from a salt lake near Jaipur in Rajputana. Being universally used, it has been fixed upon as a source of revenue, the Salt Tax producing over £3,000,000 per annum.

Mica, used as a substitute for glass in some cases, is mined in Bengal, India providing more than half of the total output of the world.

Iron deposits occur in many parts, but are little worked owing to the lack of suitable coal and of limestone which is used as a flux in smelting the ores.

Saltpetre, mined in Northern Bengal, is used in making gunpowder.

Rubies are found in Burma and other gem stones in parts of the Deccan. The diamond mines of Golconda are practically exhausted.

Tin Ore is mined in the mountains of Southern Burma.

Manufactures

About 35 million of the people are supported by various manufacturing industries. Of these, just

about one million are at present employed in factories; cotton-mills, jute-mills and railway workshops employing about half that total. Indigo factories, iron and brass foundries, printing works, tile factories and rice-mills employ considerable numbers.

But by far the greatest number are still employed in the old hand industries, for which India has been famous for centuries. Hand mills for grinding rice and other grain are found all over the country. The making of textiles, cotton and silk goods in the hotter lower parts, and of woollen cloth in the cooler hilly regions employs large numbers. Muslins of fine quality are made at Dacca, in Bengal, and Madras; Calicut gave its name to calico; beautiful silks are made at such widely distributed centres as Ahmadabad, Benares, Murshidabad and Trichinopoli; the Punjab is famous for carpets, and Kashmir for fine shawls hand woven from the silken hair of the goats kept on the hills.

Around the courts of the wealthy native princes gathered skilled workers in gold, silver, brass, wood, leather and ivory, and many of their priceless works of art may be seen in public museums and private collections of Great Britain, the United States and other countries.

These art industries still remain to supply the demands of wealthy customers in India and elsewhere; but the industries connected with the preparation of food and making of textiles received a severe blow, first by the importation of machine-manufactured goods mainly from England, and later by the establishment of mills and factories in many of the larger towns of India itself.

Cotton Mills are important in and around Bombay. The raw material is obtained from the Deccan fields; power is supplied either by coal brought by rail or sea from Calcutta, or by electricity derived from the falls of the Western Ghats; the climate is damp enough to facilitate the spinning and weaving operations,

and the dense population supplies cheap labourers who only require teaching by British overseers. Most of the machinery employed in the factories is imported from Lancashire. Indian cotton is rather coarse, and the finer types of yarn and cloth are either made from cotton imported from Egypt or else are imported from England. Thus, while in 1912 India exported some £8,000,000 worth of cotton goods chiefly to other countries around the shores of the Indian Ocean, she still imported some £40,000,000 worth of cotton goods, three-quarters of the total coming from the United Kingdom. It will be seen that the growth of this industry threatens not only the old hand-textile industry of India, but also our own cotton industry in Lancashire, especially as there is in the country a strong national movement in favour of home productions. [1]

Jute Mills have been established in the neighbourhood of Calcutta, where the facility of obtaining the raw material grown in the Sundarbans, coal from the Raniganj coal-field, and a cheap supply of labour, have encouraged the industry. The chief product of the mills is a coarse cloth used in making gunny-bags for the export of cotton, coffee, sugar and rice. Large quantities of these sacks are exported to countries round the Indian and Pacific Oceans that require them for packing their exported produce. The Calcutta mills now compete with Dundee, which firmly established its jute industry when supplies of flax and hemp from Russia were cut off during the Crimean War.

Cotton and jute cleaning and pressing mills employ large numbers in preparing the raw material for export.

Silk Mills have been established at Bombay and Calcutta to work up raw material imported mainly from China, but silkworms are reared in all parts of

[1] British exports of cotton goods to India declined from £36,000,000 in 1913 to £29,000,000 in 1918.

India, and the silk industry is widespread. Owing to the comparatively small demand for *woollen goods* in a hot country like India, steam mills have hardly commenced to compete with the old hand-loom industry in this branch of the textile trade.

Flour Mills in the Punjab and *Rice Mills* in Burma grind the grain for export, and in Assam large numbers find employment in the factories attached to the *tea plantations*, being engaged in the preparation and packing of the finished product.

Railway Works employ over 100,000 men; for, although most of the rails and rolling stock are imported from Great Britain, there is much repairing work to be done in connection with the 33,000 miles of railway now in use.

Factories for the preparation of *indigo* and *opium* employ considerable numbers in the Ganges Valley, the latter especially at Patna; while *brass foundries* and *tile factories* are also found in the same well-peopled region. Burma has *saw-mills* and *petroleum refineries* engaged in preparing its natural productions for export.

CHAPTER XVIII

INDIA (*continued*)

TRANSPORT AND COMMUNICATIONS

Rivers—Roads—Railways.

THE *great rivers* of Northern India have always been important means of communication. The *Ganges* and its larger tributaries, the Jumna and Gogra, are navigable for small vessels right to the foot of the Himalaya, more than 1000 miles from Calcutta, which is the limit of navigation for ocean-going vessels, owing to the large quantities of silt brought down by the river and deposited in its lower course. There is also no permanent obstacle to the navigation of the

Indus up to the mountain foot for small vessels, but the presence of shifting sandbanks and its shallowness in the dry season make it much less used than the Ganges. In spite of its very swift current, the broad and deep *Brahmaputra* is navigable almost up to the great bend on the borders of Assam.

The *Deccan rivers* flow in deep gorges, are raging torrents in the wet season and short of water in the dry, and descend from the plateau in waterfalls; so that they are practically useless for communication, except in the short part of their course, where they cross the eastern plain and are supplemented by canals. From the nature of their valleys they have proved obstacles rather than aids to the construction of railways. The *Irawadi*, navigable to Bhamo, is the great highway of Burma.

Canals constructed chiefly to carry off the flood-water of the rivers and for the purposes of irrigation are often used also for navigation by barges. The salt-water Buckingham Canal runs along the coast from the Godavari Delta almost to Pondicherry.

Roads have been difficult to construct and keep in repair. For in the Great Plains, which are built up of river-borne soil, there is no road-metal at hand, and until the British had constructed railways, it was too difficult and costly to bring stone from a distance. So that the roads were simply beaten tracks across the fields, thick with dust in the dry season and impassable on account of mud in the wet. In the hill districts, heavy gradients and torrential downpours defied the road-builder. Even now there are only 54,000 miles of metalled road in the country, that is, less than one mile of good road for each thirty square miles of land! In olden times, before India had been drawn into the whirlpool of international commerce, this was of little importance. Each little village community of humble, patient Hindus was self-supporting, and knew little and cared less about the doings of other villages, which it never visited unless

driven to seek protection from the onslaught of some foreign invader or of a still more terrible famine.

Railways. These were considered entirely unnecessary in India till the advent of a nation of the modern world, who conceived the idea that the best interests of this huge country, with its teeming millions, lay in bringing it under a central control, in opening up the country to foreign trade, in endeavouring to mitigate the devastating results of the periodical famines, which for thousands of years had been regarded as inevitable by the long-suffering Hindus, and in protecting its frontiers from further invasion. To further these ends no less than 33,000 miles of railway have been constructed in face of enormous natural obstacles, and of the apathy or hostility of the mass of the native population. Even now, according to one good authority, if all the railways of India were to stop running for a month it would cause less inconvenience than a three days' partial railway strike is responsible for in England. The truth of this can be understood when it is noticed that, in spite of the facts that India has a greater railway mileage than the whole of the United Kingdom and a population seven times as great, in 1912 the number of passengers carried by railway in India was less than one-third of the number in the British Isles, and the goods traffic only about one-seventh.

The railways, like the irrigation works carried out by the Government, not only benefit the country, but are also a source of profit, and in 1912 added nearly four million pounds to the revenue.

The most important railways are constructed on the broad 5′ 6″ standard gauge. The chief trunk lines will be noted.

1. *The East Indian Railway* runs from *Howrah* opposite Calcutta on the Hugli, up the Ganges Valley, through *Patna, Benares, Allahabad, Cawnpore, Agra* and *Delhi* to *Ambala* in the Punjab. With its many branches it collects the rice, wheat, cotton, opium,

oil seeds, indigo and other products of this very fertile district, and conveys them to Calcutta for export. Owing to the lowness of the country this railway was fairly easy to construct. An important branch climbs the foothills of the Himalaya from Ambala to *Simla*, the summer resort of the Viceroy and his Court.

2. *The North-Western Railway* continues the East Indian Route across the Punjab through *Amritsar*, the sacred city of the Sikhs, *Lahore*, a great railway junction, and *Rawal Pindi*, a British garrison town, to *Peshawar*, the great frontier fortress guarding the Khaibar Pass, the main gateway to India through the mountain barrier. An important branch runs from Lahore to *Multan*, the collecting centre for the wheat, cotton and other produce of the Punjab, and then to *Karachi*, the great wheat port. An important strategic railway branches out towards the Bolan Pass and the garrison towns of *Quetta* and *Chaman*.

3. *The Great Indian Peninsula Railway* has two lines from *Bombay* to *Calcutta*.

(1) Along the coast to *Surat* and then by the *Tapti Valley* to *Nagpur* on the Deccan.

(2) Over the Ghats by the *Thalghat Pass*, across the *Upper Tapti*, meeting Route (1) at *Jalgaon*, thence through the *Khandwa Gap* in the Satpura Ridge to the *Narbada Valley*, which it follows to *Jabalpur*. The route then enters the *Ganges Valley* and proceeds via *Allahabad*.

Another main line of the G.I.P. crosses the Western Ghats by the *Bhor Ghat Pass*, and runs through *Poona* and *across the Deccan* to *Madras*.

These routes are important in connection with the British mail and passenger traffic via Bombay, and also carry the cotton, wheat, oil seeds and other produce of the Deccan down to that port.

4. *The Madras Railway* follows the east coast, crossing the fertile and thickly peopled river deltas en route to *Calcutta*. It sends a branch westward through the Palghat Pass between the Nilgiri and Cardamom

Mountains to *Calicut* on the west coast, from which connecting lines run north and south. Tea, cotton, coffee and tobacco are conveyed to the coast by this route.

5. *The Central India Railway* connects *Bombay, Surat, Baroda, Ahmadabad, Jaipur* and *Delhi.*

Besides these there are some 14,000 miles of railway on the metre gauge, the most important of which is, perhaps, the line from *Rangoon* to *Mandalay, Bhamo* and the *Chinese frontier*, bringing down rice, teak, petroleum and tin for export.

These various means of internal communications enable a considerable volume of inter-State trade to be carried on, as well as facilitating the collection of exports for the overseas trade and the distribution of the imports.

CHAPTER XIX

INDIA (*continued*)

COMMERCE AND SEAPORTS

Imports and Exports—Sites and Trade of Chief Ports—Overland Trade.

THE foreign trade of India is greater than that of any other unit of the Empire outside the mother country. In 1912,[1] 111 million pounds' worth of goods were imported and 164 million pounds' worth were sent out of the country. The *excess* of *exports* was partly balanced by an import of 34 million pounds' worth of gold and silver bullion and specie, but the rest went to pay for the services of British and foreign shipping used to carry on the trade, and to pay interest and dividends on loans and capital which have helped to develop the country.

Of the *imports* 76 per cent. represent manufactured goods, chiefly *textiles* (of which the most important

[1] For 1913 figures see Appendix, p. 362.

item is *cotton goods*), *hardware and machinery.* The bulk of these came from the United Kingdom. Germany, the United States and Belgium only accounted for quite small quantities in comparison.

Foodstuffs make up another 14 per cent., by far the largest item of which is *sugar* derived from Java, Mauritius, Germany and Austria.

Of the total imports 60 per cent. came from the United Kingdom, and it is interesting to note that in spite of the establishment of the cotton-mills at Bombay and elsewhere, the importation of British cotton yarn and piece goods still shows a slight but steady increase year by year.[1] Less than 7 per cent. of the total imports are derived from the other parts of the Empire.

The *exports* reflect the agricultural nature of the country. Forty-three per cent. consists of raw material, principally cotton, jute, oil seeds, wool and teak. The cotton goes mainly to Japan, Germany, Belgium and Italy, only an insignificant quantity reaching the United Kingdom, which chiefly uses finer varieties than those grown in India. The *jute* goes mainly to Scotland, Germany and France, and the oil seeds go to the United Kingdom and France.

Exports of *foodstuffs* represent 32 per cent. of the total. *Rice* is the most valuable of all the exports, and *wheat* and *tea* are important. The last two find their chief market in the United Kingdom, where, owing to their fine quality and careful preparation, Indian teas have almost superseded the Chinese varieties. The rice from Burma goes to the Straits Settlements, Japan, and most of the European countries, including the United Kingdom.

The rest of the exports are *manufactured or partly manufactured goods*, the chief in order of value being *jute goods*, *hides and skins*, *cotton goods* and *opium*. The last two go almost entirely to China, the jute gunny-bags to the United States and other large

[1] See foot-note on page 130.

exporters of natural produce, and the hides mainly to the United Kingdom.

The mother country takes about a quarter of India's total exports, and Germany, China, the United States, Japan, France and Belgium are also good customers, taking between them nearly half the total.

From the countries named in the preceding paragraphs it will be seen that most of the commerce of India will be sea-borne, and the seaports are, therefore, of great importance.

In 1912 Calcutta did about 40 per cent. of the total trade, Bombay 30 per cent., and the rest was divided among a number of smaller ports, the chief of which in order were Karachi, Rangoon and Madras.

Calcutta owes its importance to its large, productive and densely peopled hinderland, with its network of rivers, roads, canals and railways for collecting the articles for export and distributing its imports. The Hugli distributary of the Ganges is only kept free from silt by constant dredging, and is not a good harbour. Coal for shipping is easily obtainable from the Raniganj coal-field, and coal is also shipped from Calcutta to all the other ports mentioned above, and also to Ceylon, the Straits Settlements, Hong Kong and Aden. It has almost a monopoly of the trade in jute and tea. It was one of the earliest stations of the East India Company, and when the chief route to India was by the Cape of Good Hope, it was almost as well placed as Bombay. Its selection as the British capital increased its importance, and now it has been supplanted in this respect by Delhi it may experience some decline, although it must always remain commercially important.

Bombay has the finest natural harbour in India, and its old Portuguese name, "Bom Bahia," signified the good harbour. It is situated on the eastern side of a small island, which protects it from the force of the S.W. Monsoon in summer, and the Western Ghats on the mainland opposite are sufficient pro-

tection from the N.E. winds in winter. Fine docks and wharves have been constructed to accommodate the mail-boats of the Peninsular and Oriental Steamship Line and other vessels that enter the port. The hinderland of Bombay was at first restricted by the high Western Ghats to the narrow strip of coastal plain, but the construction of the Great Indian Peninsula Railway, with its difficult zigzag ascents to the Thal Ghat and Bhor Ghat Passes, has brought the rich black cotton lands of the Deccan and also the productive Upper Ganges Valley under tribute to the port. The opening of the Suez Canal in 1869, by placing it some 2000 miles, or about a week's voyage, nearer than Calcutta to England, gave it a great advantage over its chief rival. As the most convenient port for the new capital and with its many natural advantages, it seems probable that Bombay will soon become the greatest city and seaport of the country. It has by far the largest share of the trade in cotton and oil seeds, and its cotton-mills have given it a large new export.

Karachi, standing on a small bay a little to the west of the silted-up mouths of the Indus, has a good harbour accessible at all times, except during the most violent periods of the S.W. Monsoon. It is the chief wheat port and second cotton port of the country, the North-Western Railway bringing to it the produce of the Punjab.

Rangoon stands on an inlet to the east of the delta of the Irawadi, with which it has water communication only in the rainy season. Two railways converge upon it, one from Prome on the lower Irawadi, the other from Mandalay, the old capital, which is connected by rail to the headwaters of the Irawadi, and through the Shan States to the frontier of the Yunnan province of China. Rangoon has by far the largest share of the Indian trade in rice and teak. The rice is grown in the river valleys of Burma, which, being less densely peopled, have more grain for export than

other parts of the country. Tin ore from the mountains, and petroleum from the oil-wells of Central Burma are also exported.

Madras, one of the early stations of the East India Company, has now little commercial importance, for it has no harbour capable of accommodating large vessels, and is quite inaccessible from the sea in the N.E. Monsoon. It is also subject to violent hurricanes at the change of the monsoons. Its hinderland is, however, very productive and densely peopled, and it exports teak, tea and coffee from the Ghats, tobacco, indigo and hides. Its distance from England by sea is increased by the necessity for ships to go round the south of Ceylon, Palk Strait being rendered impassable by the submerged rocks of Adam's Bridge.

Overland Trade, which accounts for less than 4 per cent. of the exports and about 6 per cent. of the total imports, is carried on chiefly with Nepal, the Shan States of Upper Burma and Afghanistan. The first sends down grain, oil seeds and timber, the second teak and tin, and the third wool and dried fruits. Cotton goods, tea and sugar are sent in return. The trade with Afghanistan is carried on by caravans of mules and camels, which traverse the Khaibar Pass under armed escort to protect them from raids by the hill tribesmen of the frontier.

CHAPTER XX

INDIA (*continued*)

POPULATION, CITIES AND GOVERNMENT

Density of Population—Delhi and other Inland Cities—Race, Language and Religion—British India and the Native States.

THE average density of population over the whole of India is about 175 persons to each square mile, as

compared with the 376 in the British Isles. But over the province of Bengal the density reaches 578 to the square mile, which is comparable to that in the West Riding of Yorkshire; while in Baluchistan it is only about eight, or less than that of Sutherlandshire. Nowhere is there a region so densely peopled as the county of London or the south of Lancashire.

The most densely peopled areas are the well-watered lowlands; the dry regions of Sind and Rajputana, and the mountainous regions in the north-east and north-west being the most thinly peopled. This is, of course, due to the dependence of the majority of the Hindus upon agriculture, which can be carried on best where the land is level, the soil good, and the water-supply, from direct rainfall or irrigation, sufficient.

Although not so dense as in the manufacturing regions of the mother country, the population of these regions is much greater than in the most fertile agricultural districts of East Anglia. For the greater heat and rainfall and absence of a winter season too cold for plants to grow enables two and often three crops of rice to be grown in a year, and, moreover, the Hindu lives much more frugally than even the English agricultural labourer.

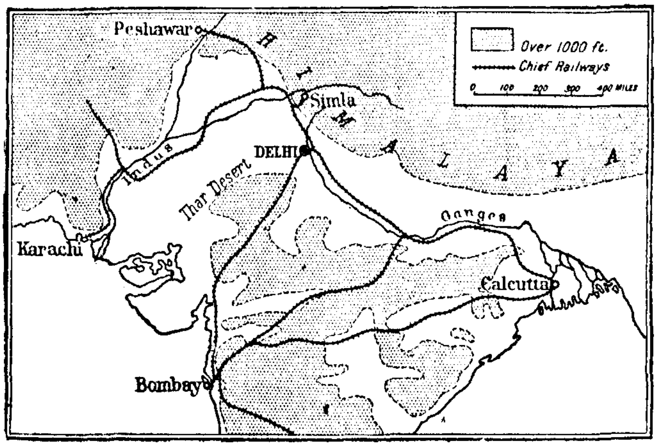
Large towns are comparatively few. There are only seventy-five with a population of more than 50,000 each, and these towns together only account for ten million of the population. So that it will be seen that the mass of the Hindus live in quite small towns and villages; indeed, nine-tenths of the whole population live in villages of less than 5000 inhabitants.

There is still only a relatively small number of emigrants from India each year. In 1912 these numbered only eleven thousand. They are chiefly coolies, who go to work on the plantations of Natal, Mauritius, British Guiana, Trinidad, Jamaica and islands of the Pacific.

INLAND CITIES

Besides the seaports noted in the previous chapter, the following are large and important cities—

Delhi, the new capital appointed by King George V in 1912, has over a quarter of a million people. It was the capital of the great Moghul Empire and of other ancient dynasties, the ruins of many of these old cities still remaining. The reason for this ancient



THE POSITION OF DELHI

FIG. 27.

importance was its central position in the great northern plain, commanding the route between the fertile plains of the Punjab and the Ganges Valley; the Jumna also providing both easy means of communication and irrigation. This fact and the reverence of the Hindus for their ancient capital, were strong reasons for the decision to change the British seat of Government from Calcutta to Delhi. Another reason was the drier and healthier situation on the water parting, as compared with the marshy delta site. This will shorten the necessary period of residence in the

summer hill-station of Simla for the Viceroy and other British officials, and, moreover, the journey from Delhi to Simla will only take fourteen hours compared with the seventy-two hours' journey from Calcutta. Also, as in Canada and Australia, it is found advisable to have the Government centre of the whole country away from any one of the provincial capitals, and Calcutta will still remain the capital of Bengal and the residence of the Governor of that province. Finally, Delhi is 300 miles nearer than Calcutta to Bombay, the great port for the landing of British mails and passengers, and it is connected by rail with all parts of the country.

Hyderabad, the capital of the dominions of the Nizam, the chief native ruler of India, is a large city of half a million people in the heart of the Deccan. It is in a very fertile district, and surrounded by a ring of hills making an excellent defensive position. The once famous diamond mines of Golconda were close by the city. It has railway connection with Bombay and Madras, and about six miles to the north lies the important junction and garrison town of Secundarabad.

Lucknow, the old capital of the ancient province of Oudh, is still a large and important town. Situated on the Gumti tributary of the Ganges, it is the centre of the fertile plain between the Gogra and the main stream, a district honeycombed with artesian wells. It retains many of the old hand industries for which India is famous, and since the Mutiny it has become an important railway junction and military centre.

Lahore is the central city and capital of the fertile Punjab. It has grown where the great rail route from Calcutta to Peshawar crosses the Ravi, and also has direct rail communication with Bombay and Karachi. It is a great military centre.

Benares is the most sacred city on the most sacred river of India, and owes much of its importance to being a resort of pilgrims. On the "ghats," or

steps, leading to the Ganges, religious ceremonies, including cremation of the dead, are of daily occurrence.

Agra is another of the old Moslem capitals of India, and is famous for the Taj Mahal, one of the most beautiful buildings in the world, erected as a memorial tomb by Shah Jehan, one of its most enlightened rulers.

Allahabad, another sacred city and pilgrim resort on the Ganges, is now the British capital of the United Provinces of Agra and Oudh. It is admirably situated at the confluence of the Jumna and the Ganges, and the junction of the great railways connecting Delhi, Calcutta and Bombay.

Cawnpur, situated on the Ganges and the Great East Indian Railway, and in a rich irrigated region growing cotton and wheat, is an important commercial centre. It has manufactures of cotton and leather goods.

Poona, behind the Western Ghats, and relatively cool and dry, is the summer resort of the Bombay Government. It stands where the Bombay to Madras railway emerges from the Bhor Ghat Pass on to the Deccan.

Amritsar, situated between the Ravi and the Sutlej, is the headquarters of the Sikh religion, which differs from Hinduism, mainly in its rejection of the caste system. The city engages in the wool trade of the hills and the wheat trade of the plains.

Mandalay, the old capital of Burma, is still the capital of Upper Burma. Situated at the great bend of the Irawadi and at the point where the main rail route from Rangoon meets the river, it is a collecting centre for the rice and teak of the upper part of the basin. It is also near the ruby mines for which Burma is famous, and is the chief centre of Buddhism in India.

Srinagar, beautifully situated in the Vale of Kashmir, a plateau about a mile above sea-level, sur-

rounded by forested and snowcapped mountains, and irrigated by the navigable Jehlam, has a delightful climate. The district is fertile, and the inhabitants specialise in the making of the famous Kashmir shawls from the long silken hair of the goats kept on the hills and from locally produced silk.

Races, Languages and Religions

The 315 million people of India are a strange mixture of races. Twenty-two different languages, each spoken by more than a million people, have been enumerated, and the languages and dialects spoken by smaller groups are almost innumerable.

The original inhabitants seem to have been of the *Dravidian* type. They are short and dark, with long, black, curly hair and broad, depressed noses, somewhat akin to the African negro. Various invasions of other peoples drove them to the higher and remoter part of the Deccan, and the half-civilised, thieving Bhils, or Bheels, of the hilly tracts of Rajputana are representative of this primitive race. Some, however, make excellent labourers, and hired Dravidian coolies may now be seen working in the rice-fields, tea plantations and cities of various parts of the country. Some 60 million people, chiefly in the Southern Deccan, speak various languages and dialects of the Dravidian family.

From about the year 2000 B.C. and onwards, successive waves of *Aryan* peoples from Persia and other parts of South-West Asia poured through the north-western passes into the plains, making agricultural settlements, first in the valley of the Indus and then of the Ganges, displacing the original inhabitants and establishing in the third century B.C. a mighty empire over the whole of Northern India. In this period Buddha lived and taught. These Aryans were a tall, well-built race, with light complexion, wavy hair and features akin to those of the best European types.

To them is due the introduction of the "caste" system, the strongly-marked social classification of the people, which is so characteristic of Indian life to-day. The rulers of the Rajput clans of the Deccan and of the Sikhs of the Punjab are the purest representatives of this race. The strong hold they established upon the country is shown by the fact that some 230 millions of the people speak languages of the Aryan family.

In Burma are to be found some almost pure *Mongolian* people, who exhibit the broad, flat, yellow face, with slanting eyes, prominent cheek-bones and straight, black hair akin to the Chinese. When they entered the country is uncertain, but the trend of the natural features of the land undoubtedly facilitated their entrance from Eastern Central Asia in early times.

In other parts of the country mingling of these three racial types has taken place.

In the Upper Ganges Valley the people are of Aryo-Dravidian type, the higher castes being more akin to the former and the lower to the latter family. In Bengal and Assam the Mongolo-Dravidian type is common, the Bengalis being broad-headed and dark-skinned and showing no trace of Aryan features. The short, hardy and warlike Ghurkas and Nepalese are of this type, their life among the mountains of the north having had considerable influence upon their character.

The Mahrattas of the Western Deccan, who gave much trouble to the British in the early days of occupation, seem to be related to the Dravidians and to the Tartar or Scythian steppe-dwellers of Central Asia, hordes of whom are known to have broken through the northern mountain barrier during the Aryan occupation of the northern plain, and passed southward down the Indus Valley towards the Deccan.

The inhabitants of the western mountain border, the warlike tribesmen of the North-West Frontier, have

somewhat Semitic features and seem to be a mixture of Turk and Persian.

Religions are almost as many and various as races and languages. About two-thirds of the people profess Hinduism, a curious mixture of religious beliefs and social observances, the chief of which are the transmigration of souls and the rigid caste system. Another fifth are Mahommedans, this creed having been introduced by successive invasions of Arabs, Turks and Afghans between the years 800 and 1200 A.D., and fixed by the establishment of the Moghul Empire in 1530.

A few others are Buddhists, Christian converts and Sikhs; while the tribes of the hills and jungles are believers in spirits, ghosts and magic.

Government of India

British India consists of about 1,000,000 square miles of territory, which came under the direct rule of the British Crown in 1858 after the Mutiny. The British sovereign appoints a Viceroy, who holds office for five years, and is assisted in the government by a Council of six members, appointed by the Crown, and the Commander-in-Chief of the British Army in India. These officials, together with sixty others, some of whom are natives, nominated by the Viceroy, form the Legislative Council, who shape the laws under which the country is governed. The expenditure of the revenue, and the foreign relations of the country are, however, subject to the control of His Majesty's Secretary of State for India, who is a member of the Cabinet and responsible to the Imperial Parliament in London. He is assisted by a Council, most of whom must have had long and recent experience in India itself.

The British territory is divided into fifteen *provinces*, each under a Governor, a Lieutenant-Governor or a Chief Commissioner, according to its importance,

and they and their Legislative Councils have considerable freedom in the administration of their own provinces. Each province is divided into *divisions* under Commissioners, and subdivided into *districts* under magistrates or "collectors," who have entire control of the administration of their districts. It is upon their energy, enterprise and tact that the successful British government of India ultimately rests; for not only have they to see that law and order are maintained, and that the revenues are duly collected, but they are called upon to advise the local councils on all schemes of health, education, agriculture and other activities upon which the well-being of the community depends.

The Native States

Scattered over the country and lying between the various British provinces are nearly 700 native states, varying in size from Hyderabad, which is almost as large as Great Britain, to states which comprise only a few villages. The native states together cover an area of some 700,000 square miles, or three-quarters of the size of British India, and contain 70 million people, or over a fifth of the total population of the country. In all the states the native rulers are hereditary and absolute, and their administration is progressive or otherwise, according to their individual enlightenment and caprice. But the British Government forbids the native princes to keep large armies, to make war upon other states or to send ambassadors to them, or to allow any European to reside at their courts other than the British Residents, who supervise the administration and assist in the government if desired. The appreciation by the native princes of the security and advantages their states have enjoyed under British rule, and advice, has been repeatedly shown in a practical manner in times of Imperial crisis.

CHAPTER XXI

INDIAN DEPENDENCIES

Baluchistan—Sikkim—Aden—Perim—Socotra—The Bahrein Islands.

Baluchistan consists of the two independent states of Kalat and Las Bela surrounded by British Baluchistan, the Agent of which state advises the local chiefs. The country is very mountainous, and for the most part barren. Some of the interior valleys and plateaus support horses, camels, oxen and mules; and under irrigation allow of the growth of grapes, apricots and other fruits. Near the coast dates are grown for export, being sent by sea to Bombay. There are traces of many minerals in the mountains, but only salt is worked to any extent. The nomad tribes make rugs, blankets and felts from the hair of goats and the wool of their sheep, and there are local manufactures of ironwork, leather and pottery. The British railway to Quetta and Chaman, via the Bolan Pass, crosses the north-eastern corner of Kalat, and the telegraph connecting India and Persia goes through Bela.

Sikkim, a small state lying to the north of Darjeeling, is important as controlling the passes by which communication between Bengal and Tibet is maintained. Its only productions are timber from the lower mountain slopes, and wool and skins from the animals that live among the mountains. It imports cotton goods and various foodstuffs from India. By a treaty with China in 1890 Sikkim is recognised as a British protectorate, and a British Resident assists the native Maharajah in the administration.

Aden, Perim, Socotra and the Kuria Muria Islands are administered by the British Resident at Aden, subject to the Bombay Government.

Aden has nothing to recommend it but its position and its harbour. Equidistant from Cairo, Bombay and Zanzibar, it has, however, been for centuries a great exchange centre for the products of India, Arabia, East Africa, Egypt and the Mediterranean. The mixed population of Arabs, Indians, Negroes, Greeks, Jews and British testifies to its ancient and modern importance in this connection. Like the Mediterranean ports, it suffered a decline with the discovery and use of the Cape Route to India, but

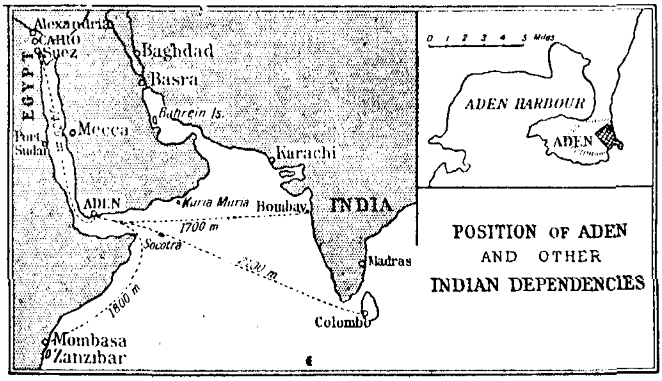


FIG. 28.

with the opening of the Suez Canal it has more than recovered. Situated within the broken rim of an old volcanic crater, with little or no rainfall and with vegetation conspicuously absent, it is not an inviting spot, and has no local productions. The water-supply for its inhabitants is a great problem. Ancient tanks hewn in the mountains behind the town have been restored, and condensers for distilling sea-water have been established.

Camel caravans bring in the celebrated Mocha coffee and gums from the semi-desert trees of Arabia. Ships bring grain, tobacco and cotton goods from

India, and hides and skins from British Somaliland; and these with various goods brought from Great Britain are interchanged at the port. It is an important coaling-station and strongly fortified, commanding a vital point on the great ocean highway to many important colonies.

Perim, a desert island in the middle of the Strait of Bab-el-Mandeb, has a good harbour and has become a coaling and cable station of some importance.

Socôtra and the Kuria Muria Islands are also semi-desert, and grow dates and gum-producing trees. There is sufficient pasture for herds of sheep and goats, which are kept by the nomad inhabitants. The latter group was obtained from the Sultan of Muskat as a landing-place for the submarine cable from Bombay to Aden.

The Bahrein Islands are an important group in the Persian Gulf, the strategic control of which is of the greatest importance to the British in the government of India, which would be threatened if any other great Power controlled the Gulf. "Gun running," or the smuggling of arms through Arabia, and thence via Persia to Afghanistan and the North-West Frontier, has often given considerable trouble.

The islands are famous for the pearl fisheries conducted by the skilful naked native divers, nearly two million pounds' worth of pearls being exported annually. Some of the islands are very fertile, and dates are an important product and export. Owing to its good harbour and political connection with India it has a large transhipment trade between that country and Arabia; exchanging rice, sugar, tea and cotton goods from the former, for dates, coffee and pearls from the latter.

CHAPTER XXII

CEYLON

THIS island, which is the most important of the Crown Colonies, is not quite as large as Scotland, and lies some fifty miles off the south-east coast of India. Physically it would seem to be just a detached portion of the Deccan Plateau, and even now there is no passage for large vessels through the shallow channel between the islands and coral reef known as Adam's Bridge. Indeed, a railway has been projected along the line of this reef, only about a mile of which would lie across open sea. The land exceeds 8000 ft. in height in the south, in the neighbourhood of Pedrotallagalla and Adam's Peak, and descends steeply to a narrow coastal plain on all sides except the north, where the slope is more gradual and the plain wider. The many rivers are too short and swift to be of much use for navigation. The coastal climate is hot, the mean temperature at Colombo always being about 80° F. At Kandy, about 3000 ft. above sea-level, the mean is reduced to about 70° F. As both the South-West Monsoon, which blows strongly from June to September, and the North-East Monsoon, which prevails from October to January, reach the island from the sea there is abundant rainfall at practically all seasons; "summer" being the period of greatest rainfall on the Colombo side and "winter" on the opposite side of the island. The delightful climate, especially of the hill-country during the inter-monsoon period, and the luxuriant vegetation have made it one of the legendary sites of the Garden of Eden, the names Adam's Peak and Adam's Bridge being due to the same myth.

Coconut trees line the shore, providing an important item of food for the people, and valuable exports of nuts, copra or dried kernel, coir, the fibre obtained

from the thick husk in which the nuts are enclosed, and coconut oil. At one time the island was undoubtedly almost covered with forests containing many varieties of timber, but the plains and lower slopes have now been cleared and under European supervision laid out as plantations. Coffee, which was once the all-important crop, was attacked by a fungoid disease, and has now given way to *tea*, which provides nearly half the total exports of the island; Ceylon ranking next to India and China as the third tea producer of the world, and supplying about a third of all the tea consumed in the United Kingdom. Plantations of *rubber* trees introduced from Brazil provide the second most valuable export of the colony; and the products of the *coconut* plantations, which cover a larger area than any other crop, rank next in order of value. *Cinnamon* and other *spices*, *cocoa*, *areca nuts*, habitually chewed by many orientals, small quantities of *cinchona*, from the bark of which quinine is extracted, *tobacco* and *coffee* are also cultivated for export. Rice-fields cover large areas of the hot, wet lowlands, but their produce is insufficient to supply the demand, and this grain, chiefly obtained from India, stands first among the imports, accounting for a third of the total. Agriculture is thus by far the most important industry of the island, and about two-thirds of the population are dependent upon it. The colony contains some minerals, the *rubies* and *sapphires* of Ceylon having long been famous. There are also valuable deposits of *graphite* used in the making of lead pencils, and small quantities of *mica* and *thorium*, the latter being useful in the making of incandescent gas mantles. There are no factories at present in Ceylon, except those engaged in the preparation of tea and other agricultural produce for export; but many of the natives still continue the old artistic hand industries of pottery, weaving, jewellery, metal and lacquer work.

The value of the exports, the chief items of which have been noted, exceeded £13,000,000 in 1912, and the £12,000,000 worth of imports consisted chiefly of rice (3), coal (1), cotton goods (1), manures, machinery, sugar and lead. About half the exports go to the mother country, from which are also obtained about a third of the imports, especially the manufactured goods. The lead which is used for lining tea-chests is largely obtained from South Australia,

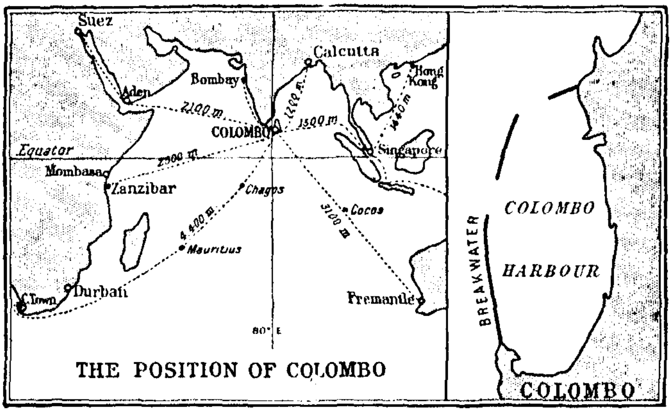


Fig. 29.

and it is interesting to note that tea-chests are also imported from Japan by millions every year.

Most of the trade passes through *Colombo*, which is the fifth port of the Empire in point of the total tonnage entering and clearing the harbour. Its importance is due to its central position in the Indian Ocean at the point of convergence of routes from Bombay, Aden, Zanzibar, Cape Town, Fremantle, Singapore and Calcutta, this fact accounting for a large *entrepôt* trade. The fine harbour is artificial, being protected from the South-West Monsoon by a huge breakwater, and strongly fortified.

It is the administrative capital of the colony, and some 600 miles of railway radiate from it, going to Jaffna in the extreme north, to Mattara in the south, via the old port of Galle, which has been eclipsed by Colombo, and to Kandy, the ancient capital, and other health resorts among the mountains. *Trincomali*, on the north-east coast, has a good natural harbour used as a naval station.

Ceylon now has about four million inhabitants, nearly three-quarters of whom are the short and relatively fair-skinned Sinhalese, descendants of the Aryo-Dravidian people who invaded the country from India about five centuries before the Christian Era. In religion they are mainly Buddhists, and the country abounds in ancient and modern temples, pagodas and " Buddhas." Nearly another million are tall, dark Tamils, more recently imported Dravidians from Southern India, who chiefly work on the plantations and are Hindus in religion. There are also considerable numbers of Mohammedans, who are descendants of the Moors or old Arab traders, and some Malays, who are also followers of the Prophet. Among the hills of the north-east are a few primitive cave-dwelling hunting tribes known as Veddas, who are supposed to be the remnants of the aboriginal population. The Europeans, who consist mainly of planters and British soldiers, number less than 9000. Over half the population live in the south-west corner of the island, which is more productive and most conveniently situated for trade.

CHAPTER XXIII

BRITISH MALAYA

Extent—Physical Features—Climate—Productions—Communications—Singapore and other Commercial Centres—Labuan—Cocos Islands—Population.

THIS may be taken to include those parts of the Malay Peninsula and the neighbouring islands which are wholly or partly under British control. The chief political divisions are—

1. *The Straits Settlements* of Singapore, Penang and Wellesley, and Malacca, together with the Cocos and Christmas Islands and Labuan. These constitute a Crown Colony under a British Governor.

2. *The Federated Malay States* of Perak, Selangor, Negri Sembilan and Pahang, together with the States of Trengganu, Kelantan, Kedah, Perlis and Johore, which are controlled by native rulers assisted by British officers, who act in an advisory capacity.

3. *British North Borneo*, administered by a British chartered company, and Sarawak and Brunei, native territories controlled by Rajah Brooke, an Englishman.

The whole area is slightly larger than the British Isles.

The position, particularly of the Straits Settlements, is of very great importance, as it controls the great commercial highway from India to China, Japan and Northern and Eastern Australia. The surrounding seas are relatively shallow, lying over the "continental shelf" of S.E. Asia. They abound in fish, which is an important article of food with the natives, many of whom live in pile-dwellings on the seashore, or on rafts.

All the States consist of a fairly narrow coastal plain thickly forested, but capable of cultivation, and a rugged, mountainous and little-known interior, but the mountains are known to be rich in minerals,

especially tin; this region contributing about half of the total output for the whole world and four-fifths of the British supply of that metal. The rivers, which are full and swift in the interior, form the best and often the only roads through the forested lowlands.

Climate and Productions. The climate is of the equatorial type—always hot and with abundant rainfall—the wettest seasons occurring at the time of the vertical mid-day sun, and the months from November to April being drier than the rest. This climate gives rise to dense, steaming jungle, which covers the lowlands and extends up the mountain slopes to more than a mile above sea-level. It is rich in *tropical timbers, bamboo, species of rubber-trees, fruits* and *spices*, and harbours many kinds of wild animals and reptiles, and natives in a very low state of civilisation. The principal articles exported from these forests are, in order of value: *gums*, including copal and dammar used in making varnishes; *spices*, especially pepper; *copra*, or dried coconut kernel, from which the oil is extracted for use in the soap industry, and for making margarine, while the refuse is made into cattle-cake; *tapioca*, obtained from the tubers of the manioc; *sago*, the pith of a species of palm-tree; *gambier*, extracted from the leaves of a shrub and used in tanning; *rattan canes* and *pineapples*, the latter being largely tinned at Singapore.

To provide food for the natives, drained and irrigated *rice-fields* have been laid out in the lowlands where the forest has been cleared; but rice has also to be imported, mainly from India and the Dutch islands. But the most valuable plantations are those of *rubber* plants, introduced from Brazil to supplement the inferior native wild product. Rubber now accounts for nearly half the exports of the Federated States. In Borneo there are valuable plantations of *tobacco* in the clearings. The only

item of export that exceeds these vegetable products in value is *tin*, which constitutes more than half the total exports of the States and almost half of those of the Straits Settlements. Most of the mining is carried out by Chinese coolie immigrants, and the ore is roughly smelted at Singapore to prepare it for export to South Wales.

Besides tin, small quantities of *gold* and other metals are mined, and the island of Labuan has large deposits of *coal*, which, however, are not much worked. Christmas Island has enormous *phosphate deposits*, used in the making of artificial manures and chemical products, and these form the chief wealth of the island.

In the higher parts of the interior, where the country is more open, many of the natives keep cattle, and hides are exported.

Of the *imports*, rice is by far the largest, followed by *cotton goods, sugar, fish, tobacco, machinery, coal* and *petroleum*.

Transport and Communication. The rivers are still the most important lines of communication, and are largely used for floating down rafts of timber, and for transporting produce in the native barges and canoes. There are a few well-marked tracks through the forests well trodden by the natives, who traverse them to the nearest port carrying their bundles of forest produce to market on their heads or backs. In the British districts near the coast some good metalled roads have been built, and there is now a railway from Wellesley, opposite Penang, right through the Federated States to a point opposite Singapore, with branches to the chief seaports and also to mines and plantations in the interior. The ports are connected by telephone and telegraph wires, and Singapore has a wireless station and cable connection with India, Australia and the East.

Chief Commercial Centres. *Singapore* is by far the most important. Situated at the converging

point of routes from India, China, Japan, Australia and the surrounding islands, having a sheltered harbour with good wharves, and being free to the trade of all nations, it has attracted an enormous trade. Its imports and exports both exceed £30,000,000 per annum, as it is the great collecting and distributing centre of the whole region; for only a very small proportion of these values represents locally consumed or produced articles. The town, which is the residence of the Governor and is well fortified, is on the south-east side of the island of Singapore, which measures about 30 miles from east to west and 15 from north to south, and is separated from the State of Johore by a channel about three-quarters of a mile wide.

Penang, which has been eclipsed by Singapore, has, however, a large and thriving trade. It is situated on the east side of an island which controls the northern entrance to the Straits of Malacca, and the two-mile stretch of water between it and the mainland makes a fine harbour. Its trade is about half that of Singapore in value.

Malacca, an ancient trading settlement of the Portuguese and the Dutch, is now much less important than either Singapore or Penang, but its trade is considerable.

Labuan, with a fine harbour, has not realised expectations as a commercial centre; for, although it has large and valuable coal deposits, it is difficult to get labour to work them, as the natives of the region can get abundant food without working and need little clothing, and therefore have no incentive to take up hard manual labour. The mainland opposite, too, is at present little developed, and Singapore, although 800 miles away, is a powerful and old-established rival.

The Cocos Islands are a group of coral atolls situated half-way between Colombo and Fremantle on the direct steamship route. Their chief product is the coconut, and the chief export copra. But as the

landing-place of the important submarine cables from Colombo to Fremantle and from Mauritius to Batavia, and as a wireless station, they have some strategical importance. They will always be famous as the scene of the sinking of the *Emden*, the notorious German commerce-raider, which had put into the harbour with a view to wrecking the telegraph station, when she was discovered and destroyed by the Australian cruiser *Sydney*.

Sandakan on the east coast and *Jesselton* on the west coast are the chief ports of British North Borneo, but their trade at present is small. A railway runs from Jesselton to Brunei Bay. Beside tobacco, rubber and typical forest products, the exports include edible birds'-nests and bêche-de-mer, or sea-slugs, two delicacies that find a market in China.

Kuching, twenty miles from the mouth of a navigable river, is the capital and chief seaport of Sarawak, and exports sago, pepper, gutta-percha and gold.

POPULATION. The whole region under consideration contains only about two million people, as far as can be estimated, about half of whom are Malays or various native tribes and nearly as many Chinese. There are about two hundred thousand Indians and a few thousand whites.

The natives are short, brown people with round heads, short, flat noses and slightly oblique eyes. Some have straight hair, others a mop of curls. Driven by stronger invaders into the mountainous and forested interior, many of them, like the naked savage Sakai, have remained in a very low state of civilisation, and some tribes, notably the head-hunting Dyaks of Borneo, still indulge in freaks of cannibalism. They get their living by hunting in the forest, their weapons being the bow and arrow or the blowpipe and dart; by collecting fruits, and by fishing in the rivers and shallow seas. A few indulge in primitive forms of agriculture, and cultivate rice and various roots, such as the manioc, from which tapioca is obtained.

Their houses are constructed of bamboo and leaves, and whether built over the water or on land are always built on piles, as a protection against wild beasts and reptiles. The people are naturally indolent and make little progress. Most of the more highly skilled and laborious work in tin mines, plantations or factories is done by industrious Chinese settlers, many of whom have become very wealthy and control much of the trade. In the Straits Settlements and Federated States they now outnumber the Malays. The Tamil coolies from Southern India and Ceylon are employed mainly in the rubber plantations controlled by English or Chinese planters.

CHAPTER XXIV

THE CHINESE STATIONS

Hong Kong—Wei-hai-wei.

Hong Kong is by far the more important. It consisted originally only of the island taken from China in 1841, but since then the Kaulun Peninsula on the mainland opposite has been added, and a large piece of the mainland leased from China for strategic purposes; for this is a highland region which, with modern artillery, could easily command the island and harbour of Hong Kong. The island consists mainly of a granite ridge some ten miles long, rising in the Peak to a height of 1825 ft., with lower ground to north and south. The picturesque island-studded Lai-i-mun Channel, half a mile wide, separates it from the nearest point of the mainland.

The climate is of the monsoon type. The summer months are hot and wet, the South-East Monsoon winds blowing towards the heated continent from off the Pacific and bringing heavy rainfall. In winter the

prevailing winds are from the north and north-west, and are not only dry but often quite cold, the mean temperature in January being only 40° F., although Hong Kong is just within the tropics.

The island has been denuded of its forests, and granite is practically the only local product of any value. Fishing is, however, important in the harbour and along the neighbouring coast. Cotton-spinning, sugar-refining and brewing are carried on with materials grown on the mainland, and there is an industry in rope-making, shipbuilding and repairing connected with the large shipping trade of the port.

But it is as an *entrepôt* that Hong Kong is most important. With a fine, sheltered harbour lying off a densely peopled and productive country, and with no artificial restrictions to trade, it has, like Singapore, become a great commercial focus, and ships of all nations can be seen in its harbour. It collects tea and silk from the mainland for export, and textiles, machinery and other manufactured articles from the United Kingdom, United States and other countries to distribute in China, much of the trade being carried on by Chinese merchants. Indeed, the security given by British occupation has attracted large numbers of Chinese from the mainland, and only 8000 out of the total population of 366,000 are Europeans. More than a quarter of the total import and export trade of China passes through Hong Kong, and it is the only port in the Empire with a larger tonnage of shipping entering and clearing annually than that of London.

At Victoria, the largest settlement, which is built along the northern shore of the island facing the harbour, is an important Government dockyard and a naval and military station. The chief commercial docks are at Kaulun.

Wei-hai-wei is a town and seaport on the northern shore of the Shan-tung Peninsula, which was leased to Great Britain by China in 1898. As in the case of

Hong Kong, sufficient ground has been leased to secure the harbour from attack by long-range artillery. The district has a fine, healthy climate with warm summers but rather cold winters, and is used as a sanatorium for the ships of the China Squadron. The trees, fruits and cereals of Central Europe flourish, and silkworms are fed on oak leaves, as the mulberry does not thrive. The commerce is at present small, the principal export being ground-nuts, but the district is being improved, and the population, which now numbers nearly 150,000, is increasing. It has not yet been fortified, but acts as a naval base for the fleet which protects our commerce in the China Seas.

PART IV

AFRICAN POSSESSIONS

CHAPTER XXV

THE UNION OF SOUTH AFRICA

Discovery and Settlement—Surface Features—Climate.

THE rounding of the Cape of Good Hope was one of the triumphs of the Portuguese navigators at the end of the fifteenth century, but no European settlement was made till the Dutch established the Cape Colony in 1652. This passed into British possession during the Napoleonic wars. The Dutch farmers, or Boers, in 1836 migrated first across the Orange River and later across the Vaal, forming the Orange Free State and the Transvaal, while Natal was annexed by Great Britain in 1843. As a result of native risings Zululand, Basutoland and Swaziland came under British control, and, following the war with the Boer Republics, the whole of this territory became incorporated as the self-governing colony of the Union of South Africa in 1910. The Union territory is just four times the size of the United Kingdom.

SURFACE FEATURES

South Africa consists in the main of a plateau known as the *High Veldt,* with an average height of a mile above sea-level. The eastern edge is higher than the western, and Mont aux Sources in the Drakenberg Mountains of Natal is over two miles high. The descent to the coastal plain on this side is very steep

and broken, and the railway from Durban on the Indian Ocean to Johannesburg on the plateau traverses many sharp curves and steep gradients, crossing the Drakenberg in Van Reenen's Pass at a height of over a mile. These mountains are rich in coal, iron and gold.

In the south the descent from the plateau is by three steps, the broad terraces being separated by high mountain ridges known by different names in different parts. The first terrace lying at the foot of the Nieuwveld Range is known as the *Great Karroo*, a broad stretch of undulating plains stretching for about four hundred miles from east to west, and one hundred from north to south, at a height of half a mile above sea-level. The southern boundary of this step is the Zwarte Bergen, falling steeply to the second terrace known as the *Little Karroo*, which is much narrower. It is marked off from the very narrow *Coastal Plain* by the steep slopes of the Lange Berge and other ranges. This step-and-terrace formation presented considerable obstacles to railway construction; but railways now rise to the High Veldt from Cape Town, Port Elizabeth and East London, the ascent from Table Bay by the Hex River Valley being as devious as its scenery is magnificent.

The *High Veldt* is a gently undulating plateau broken here and there by isolated flat-topped heights known as *kopjes*. These rise several hundred feet above the level of the surrounding country, and are due to the weathering of the horizontal layers of rock which form the surface of the plateau. But running east and west between Johannesburg and Mafeking is a ridge of high land known as the *Witwatersrand*, due to an intrusion of harder granitic rocks through the horizontal shales and sandstones. This ridge consists of the richest gold-bearing rock in the world, and upon it most of the wealth and recent development of South Africa depend. In the east of the Transvaal the High Veldt descends steeply by the Drakenberg

to the Low Veldt, or Bush Veldt, but the coastal plain below this is in Portuguese territory.

As in the Deccan of India and in Australia, this plateau formation is unfavourable to the utility of the rivers. Around the southern and eastern coasts, where the rainfall is fairly heavy, a number of picturesque torrents rush down the steep slopes to the sea; but they are much too swift for navigation, and deposit sand bars at their mouths, which are thus rendered valueless for harbours without costly dredging. On the plateau itself the *Orange* and its tributaries, notably the Vaal and Caledon, gather the surplus waters of the Drakenberg and take them right across the veldt to the Atlantic coast; but, owing to the dryness of the climate and the horizontal stratification of the rocks, the river has carved out a deep narrow channel which makes it of little use for communication or irrigation; and its volume is so uncertain that navigation is impossible. Its rapid descent from the plateau to the coast is another drawback. The Limpopo is of the same type. Being obstacles rather than aids to communication, the main use of these rivers is as natural boundaries between the various States.

Again, like most plateau countries, South Africa is very deficient in natural harbours, Durban, protected by a sandspit, being the best. Table Bay, at the foot of Table Mountain, makes a good harbour now it has been protected by a breakwater from the Roaring Forties that rage in that region in the winter months. Saldanha Bay, sixty miles farther north, has a better anchorage, but its hinderland is waterless and barren. Algoa Bay needs protection from the gales of the South-East Trades, which make the approach to Port Elizabeth dangerous in the summer months. False Bay has a very shallow approach and treacherous currents; and the meeting of the cold Antarctic Current with the warm Mozambique Current causes dense fogs in that neighbourhood.

CLIMATE

Only the northern edge of the Transvaal lies within the tropics, and the rest of the Union is within the warm temperate zone, experiencing hot summers and mild winters, except in the highest parts, where the winters are cold, although snow is rare. Owing to the dryness of the atmosphere over the greater part of the plateau, the climate is very sunny and there are considerable differences between the temperature of day and night. Sharp frosts are common on winter nights. January is usually the hottest month, and the mean shade temperature for this month ranges from 80° F. in the north of Natal to 69° F. at Cape Town. The plateau is cooler than the coastal districts in the same latitude, but Johannesburg, a mile above sea-level, has a mean temperature of 70° F. in its hottest month. The mean temperatures for these three districts in July, the coldest month, are 68° F., 54° F. and 47° F. respectively, showing that the inland district has a greater range of temperature for the year than the sea coasts.

The mean temperature and rainfall of the east coast are increased by the warm Mozambique or Agulhas Current, which is the southern branch of the Equatorial Current of the Indian Ocean; while an opposite effect is observed on the west coast, due to the cool Benguela Current from the Antarctic. Off Cape Agulhas, where these meet, fogs are frequent. These may be compared with the fogs off Newfoundland, due to the meeting of the warm Gulf Stream and cold Labrador Current (see p. 284).

But the most important climatic differences for the colony are in the matter of rainfall. The precipitation is scanty in most parts, the wettest district, along the coast of Natal, only averaging just over forty inches a year, while Port Nolloth on the west coast gets less than three inches. When these quantities are noted in connection with the high average

temperatures prevailing, it will be seen that lack of rainfall is one of the great drawbacks of South Africa, as it is in large parts of Australia. The reasons in the two colonies are also similar. For the greater part of the year the country lies within the region of the South-East Trades. These come moisture-laden from the hot Indian Ocean, and, being forced upwards against the high eastern edge of the plateau, are cooled, and deposit most of their rain on the narrow coastal strip of Natal. The quantity of rainfall therefore diminishes very rapidly with distance from the east coast, and the western side of the country forms part of the Kalahari Desert. These winds are most strong and regular in the summer months, so that Natal and all the eastern half of the plateau get most of their rain in the hottest part of the year, making them more suitable for the growth of maize than of wheat. Durban gets over two-thirds of its total rainfall in the six months from October to March.

The Cape Town Peninsula, however, gets nearly two-thirds of its total rain in the four winter months, from May to August, when it comes within the influence of the Roaring Forties, or Brave West Winds, and its summers are hot and droughty. The climate of this corner of Cape Colony is therefore like that of the Mediterranean and South-West Australia, and is admirably suited to the growth of grapes and other fruits and also of wheat.

Along the south coast, between these fairly distinct belts of summer and winter rainfall, the precipitation is well distributed throughout the year, and this is consequently the best-forested part of the country. On the karroos and the veldt unpleasant dust-storms are fairly frequent in times of drought. These are often relieved by severe thunderstorms, which cool the air and bring welcome rain.

On the whole, then, the climate of South Africa may be regarded as extremely healthy and suitable for white settlement. Only along the east coast and

in the low Bush Veldt of the Eastern Transvaal is malaria at all prevalent, and indeed the dry, bracing air of the karroos is often recommended as a cure for diseases of the lungs. But the long periods of drought in the interior make those parts of little use for agriculture, and destroy the value of the rivers either for purposes of irrigation or navigation. South Africa, unlike many dry areas of Australia, does not seem to hold large available supplies of underground water, so that most of the veldt, which is naturally treeless and covered with coarse grass or scrub, tends to remain a pastoral country, and it is necessary for the farmers to construct "dams," or tanks, to hold the surplus water of the rainy seasons for watering their flocks in the droughts.

CHAPTER XXVI

UNION OF SOUTH AFRICA (*continued*)

INDUSTRIES AND PRODUCTIONS

Forestry—Fishing—Cattle and Ostrich Farming—Agriculture—Mining—Manufactures.

Forestry. The only trees of any size or value grow along the southern coast of Cape Colony and in Natal. Owing to the absence of a hard winter all the trees are evergreen. Large areas of forest seem to have been destroyed by the natives in earlier times in order to secure fertile soil for cultivation and richer pasture for their flocks in these well-watered regions; but there is now in the Union, as in the other colonies, a Forestry Department of the Government, which controls the felling of timber and makes new plantations where desirable. In Natal, which has a very similar climate to that of South-East Australia, the "blue gum" species of Eucalyptus has been introduced from the

latter country, and will in time supply valuable timber.

The largest remaining forests are now between Mossel Bay and Port Elizabeth, extending some fifteen miles inland from the coast, and north and east of King William's Town. The principal useful trees are: (1) *Stinkwood,* which has an unpleasant odour when newly cut, but which is used in building and for making the famous Cape carts or bullock waggons; (2) *Yellow-wood,* a sort of pine, used for floors of houses and for waggon building, and (3) *Sneezewood,* which, owing to its water-resisting properties, is very useful for making piers, jetties, bridges and fences. *Boxwood* and *ironwood* grow in some parts, and the Cape peninsula has small *cedars, pines* and *oaks.*

In Natal there are considerable plantations of *acacia* or *wattle,* especially in the midland districts. The bark of these trees is useful in tanning, and it is exported in large and increasing quantities each year. Insufficient rainfall and long droughts prevent the growth of timber in the Orange Free State and over most of the Transvaal, but there are forests along the banks of the Limpopo.

Owing to the scarcity of timber over a million pounds' worth is imported annually into the country, mainly for building purposes. Australia is the chief source of the supply.

South Africa, particularly the Cape district, is strikingly rich in beautiful flowers. Arum lilies grow wild in great profusion; there are scores of beautiful varieties of heather, and many orchids and other English hothouse plants are natives of the Cape.

Fishing. The shallow Agulhas Bank and the cold waters of the Antarctic Current are very favourable to fishing, and a large number of edible varieties are caught, including "*Cape salmon,*" *soles, lobsters* and *crawfish.* The fisheries, once carried on by natives in small boats near to the shores, have now been extended under white supervision, and steam trawlers

like those used on the Dogger now fish the waters more than 100 miles from the coast. The chief fishing ports are Cape Town, Simon's Town, Port Elizabeth and Durban. Large quantities of fish are sent by rail to the towns of the interior, and there is a small but increasing export of fish, particularly of tinned lobster.

A whaling fleet operates from Durban, and large quantities of oil, whale-bone and fertilisers made from the refuse are exported.

The inshore waters and rivers of the south and east coast provide excellent sport for the angler and fish food for the natives.

Pastoral Industries. The keeping of sheep, goats, cattle and ostriches, is the most important branch of farming in South Africa, and after mining provides the greatest proportion of the wealth and exports of the colony.

Sheep. There are some 30 million sheep in British South Africa, over half being kept in Cape Colony, and about a third in the Orange Free State. The chief difficulties of the sheep farmer are lack of water and shade for the flocks, and the presence of many diseases due to the hot, dry weather. In the best-watered parts an acre of grazing land is necessary for each sheep, and in some parts as much as eight acres are required. The larger sheep farms on the karroos have from 3000 to 10,000 sheep each. In the drier western districts and in Bechuanaland, common Cape sheep, more valuable for their flesh than their wool, are chiefly reared. Millions of the fine-woolled merino variety, first introduced from Spain, are kept on the richer pastures of the Great Karroo, where the natural "sheep bush" provides good feed, especially round Queenstown, King William's Town and Somerset East. There are some small but valuable sheep farms in the district lying south-east of Cape Town. The sheep are sheared in October, and the wool is despatched to the wool-washing

establishments at Uitenhage and other places having a good supply of water. It is then carefully graded and packed in bales for export, principally from Port Elizabeth and East London. Sheepskins are also exported, but the frozen-meat trade has not yet been taken up.

Goats. About 12 million of these are reared in South Africa, about three-quarters of the total being kept in Cape Colony. More than half the number consist of the native Kaffir goats, whose flesh is largely eaten, especially by the natives; but there are now large herds of Angora goats, originally introduced from Asia Minor, whose long white silken "mohair" is very valuable, being chiefly used with wool and cotton in the making of fine cloths for dress material. The native goats live in the rough mountainous districts between the karroos, the animals being very hardy and surefooted; but the Angora goats are kept in herds on the Great Karroo between Graaf Reinet and Cradock. There are also flocks in the south-west corner of the Transvaal, in the upland districts of Natal, and in the Free State. Nearly a million pounds' worth of mohair and large numbers of goatskins are exported annually.

Cattle. About half of the six million cattle of the colony are found in the Cape Province, and most of the rest in the Transvaal and Orange Free State. Even in the best-watered parts, ten acres of land per head are necessary. Owing to the liability of horses to disease, and to the absence of good roads, oxen are largely used for transport, the bullock cart being a characteristic feature of South African life. The largest numbers of cattle are kept on the well-watered coastal plains of the south-east, especially in the native states of the Transkei, Tembuland and Pondoland. Cattle are also kept in the eastern districts of the Great Karroo, and also in Bechuanaland in the neighbourhood of Mafeking and Vryburg. Dams for preserving the summer rainfall are abso-

lutely essential in the latter districts. Fine herds of cattle are kept in the neighbourhood of Pretoria and Bloemfontein. In Natal cattle-rearing is hindered by the prevalence of lung-sickness, especially in the hot, wet districts; while in the upland regions provision has to be made for supplying the cattle with food and shelter in the winter. In the cold, dry winter months Boer farmers of the High Veldt often trek with their herds to the moister Bush Veldt, or into Natal. Dairy farming is now being successfully taken up in many districts, butter being made chiefly in the eastern karroo and coastal centres of Cape Colony; while Bechuanaland specialises in cheese. The creameries are largely worked on the Danish co-operative system, the farmers of a large district all sending their cream to a central depot, where it can be churned under better conditions and more economically. The output of butter and cheese is still, however, insufficient for the demands of the colony, but there is a large export of hides. The South African herds are improved by the importation of pedigree stock from Great Britain, the Government making grants for this purpose.

Pigs are not largely kept except in the native states to the east and at Malmesbury to the north of Cape Town.

Ostrich Farming is a characteristic industry of Cape Colony, where about three-quarters of a million are reared for the sake of their feathers. The industry is very profitable to those who understand it; but it is largely speculative, being dependent upon varying freaks of fashion. The bird was first introduced from Northern Africa, of which it is a native—the karroo being similar to the scrubby borders of the Sahara and Northern Sudan. The largest farms are on the Little Karroo at Oudtshoorn, Uitenhage and Grahamstown. A few ostriches are kept in the Northern Transvaal and in Natal, but they do not thrive greatly. The feathers are chiefly

Tobacco is cultivated in many parts, especially in the Cape Peninsula, at Oudtshoorn, and at Rustenburg in the Transvaal. Imports of foreign varieties however, exceed the export of the home-grown leaf.

Sugar-canes are largely grown in the coastal regions of Zululand and Natal. Indian coolies are employed on most of the estates. Sugar-mills have been established in various parts, and there is a refinery at Durban.

Cotton has been experimented with in the coast regions from East London to Durban, but has not yet met with much success.

Tea, however, thrives in the coastal districts north of Durban, and the area under this plant is increasing. An export of tea has already commenced. Large supplies of cheap native labour assist this industry.

Sweet potatoes and *millet* are largely grown in the eastern districts of Cape Colony and in Natal, as food for the natives. All sorts of vegetables can also be grown.

The country will probably always remain a pastoral rather than an agricultural one, but in the districts where rainfall is sufficient, or scientific " dry-farming " and irrigation can be applied, mixed farming should become increasingly popular, as good local and foreign markets can usually be found for all the produce raised.

Mining. South Africa is above all things a miner's country, and although the minerals have probably led to most of the political troubles of the colony, they have contributed most largely to its material wealth and development, and now make up over four-fifths of the total exports. The Transvaal is the richest province, having the most valuable supplies of both gold and coal. Cape Colony is famous for diamonds, and has good deposits of copper and salt. The Orange Free State has diamonds and salt, and Natal is rich in coal.

Gold. The Transvaal is responsible for more than a third of the world's total yearly output of this precious metal, £39,000,000 worth being produced in 1912. This is nearly all produced in the Rand district, which stretches some fifty miles to east and west of Johannesburg, the commercial centre of the whole district and the largest town in South Africa. The gold is mainly found in tiny grains throughout the mass of a hard conglomerate rock, and can only be extracted by expensive operations needing much labour and elaborate machinery and chemical processes. The mining is assisted by rock drills and blasting with dynamite, and these operations give rise to much dust, accounting for the prevalence of miners' phthisis, which is an unfortunately common disease among those employed. This work is chiefly carried on by Kaffirs working under white overseers, blacks outnumbering whites by about ten to one at the mines. The 200,000 odd natives are recruited from the far corners of the colony, and from Mozambique. During their stay at the mines they live in an enclosure, or "compound" attached to the mine, and are fed and clothed by the mining company. At the end of the period they may sign on for a fresh contract; but, as the underground work is quite as distasteful to them as any other, they usually take their wages and return home, where they are then comparatively rich men and can live in idleness for several years. The problem of recruiting labourers led a few years ago to the importation of 50,000 Chinese coolies, but these have now all been repatriated.

The ore, having been raised, is then crushed by heavy steam hammers, or "stamps," and then the gold is separated from the dross by washing and various chemical processes. About a million ounces of silver, valued at £124,000, were also separated from the gold in 1912.

Besides the Rand mines there are a few alluvial

workings in river valleys, and also quartz mining at Barberton, where the first mine was opened in 1884, Lydenburg and Klerksdorp. The work is mainly carried out by wealthy companies under the control of Jewish or British financiers, whose ideals are very different from those of the easy-going Boer farmers and often lead to political friction. It may be of interest to note that South African mining shares are known on the Stock Exchange as "Kaffirs."

Diamonds are chiefly found in the corner of the Cape Province lying between the Vaal and its tributary the Modder, Kimberley being the centre of the whole district. The most valuable gems, however, come from the Barkly district on the north bank of the Vaal, and some are found at Kuruman in Bechuanaland. The diamond-bearing district extends from Kimberley over the borders of the Transvaal to Bloemhof, and to Jagersfontein and Koffyfontein in the Orange Free State. There are also valuable mines near Pretoria. A few diamonds are obtained by individual speculators in the alluvium along the banks of the rivers, especially the Vaal; but the most extensive operations are carried out by the wealthy De Beers Company. Over fifty thousand Kaffirs and about nine thousand whites are employed, the "compound" system being general, as in the case of the gold mines. The stones are found embedded in a sort of blue clay, over more or less circular areas sometimes half a mile in diameter and tapering downwards in such a manner as to suggest that they were once the craters of old volcanoes. The miners dig out this "blue ground," leaving large open pits. The soil is then spread out on "floors" to dry in the sun, after which it is carefully looked over for the gems, the smaller ones being finally separated by washing. About £10,000,000 worth of the gems are exported annually to Amsterdam and London, where they are cut and set. Stones

worthless as jewels are often, on account of their hardness, very valuable for use in cutting and drilling and as bearings for delicate machinery.

Coal to the value of almost £2,000,000 was mined in 1912. Over half of this came from the Transvaal and most of the rest from Natal. It is the best coal found in Africa, but is not as good as that found in South Wales or Pennsylvania. It is sufficient to supply the present needs of the whole colony, and almost half of the output is exported, especially from Natal, to the shores and islands of the Indian Ocean. Some better quality steam coal is still brought from Wales to Cape Town for shipping purposes. The largest mining centres in the Transvaal are Middelburg, Boksburg and Springs to the east of Johannesburg, native miners outnumbering the whites by twenty to one. In Natal the richest district is in the Drakenberg near the Klip River, Dundee and Newcastle being the chief centres. Much of the coal can be quarried from the hillside, and no shaft exceeds 200 ft. in depth. Machine coal-cutters are largely used, and most of the miners are natives. Ships calling at Durban fill their bunkers with the coal, and much is used on the Government railways. Coal is mined in the Orange Free State at Heilbron and Kroonstad near the Vaal River, and in Cape Colony near Molteno and Indwe in the Stormberg Range.

Copper is chiefly mined at Ookiep in Namaqualand, the north-west corner of the Cape Province. The mines are in a barren district, and all food and other necessaries have to be carried from Cape Town either by rail and road, or by sea to Port Nolloth, and then along the 100 miles of railway leading to the diggings. Smaller quantities are mined at Pietersburg in the Drakenberg Mountains of the Northern Transvaal.

Salt is obtained by the evaporation of shallow salt lakes, or "pans," in various parts, notably Jacobsdal on the western border of the Free State.

Tin is chiefly mined in the Rustenburg district north of the Rand. *Asbestos* is found at Kuruman and Prieska in Cape Colony and Eshowe in Natal. *Iron ore* is found in several places, but at present is not much worked.

Manufacturing. There are very few factories in South Africa, and nearly all the manufactured articles required are imported from the mother country. There are, however, springing up near the larger towns factories for the preparation of foodstuffs from local products, such as flour, jam and wines near Cape Town; and tea, sugar and coffee near Durban. There are also breweries and tobacco factories, and a few clothing factories.

Explosives for firearms and for use in the mines are made at Modderfontein near Johannesburg, Somerset West near Cape Town, and near Durban. Tallow from the local cattle is made into soap and candles at Germiston in the Transvaal, and the presence of local limestone and iron ore has given rise to cement factories and smelting works near Pretoria, where rolling-stock for the railways is also made. There are also railway works at Uitenhage near Port Elizabeth, which itself has miscellaneous industries, notably wool-washing. Waggon and harness making are everywhere important, local timber and hides tanned with locally produced wattle-bark providing the necessary material. The native Kaffirs and Malays and Indians do most of the unskilled manual labour required, and even skilled white workmen find their competition very keen.

CHAPTER XXVII

UNION OF SOUTH AFRICA (*continued*)

COMMUNICATIONS AND COMMERCE

Railways—Exports and Imports—Seaports.

THE deep and broken channels of the rivers and their uncertainty of volume make them useless for communication, and render the construction of canals impossible. The broken mountainous nature of much of the country, especially the better-watered portions, also makes the construction and upkeep of good roads very difficult. This fact, added to the liability of horses to disease, makes the Boer "trek-cart," drawn by a team of bullocks, the characteristic transport vehicle of the colony. When moving from pasture to pasture on the veldt, especially in the dry season, the Boer farmers live and sleep in these carts.

For the greater development of the country railways were essential, and there are now nearly 8000 miles of railway under the control of the Union Government. Practically all lines are on the 3′ 6″ gauge.

Johannesburg, the largest and wealthiest city in the country, may be regarded as in some respects the railway centre of the colony, lines radiating from this point to the various seaports. The following lines are the most important.

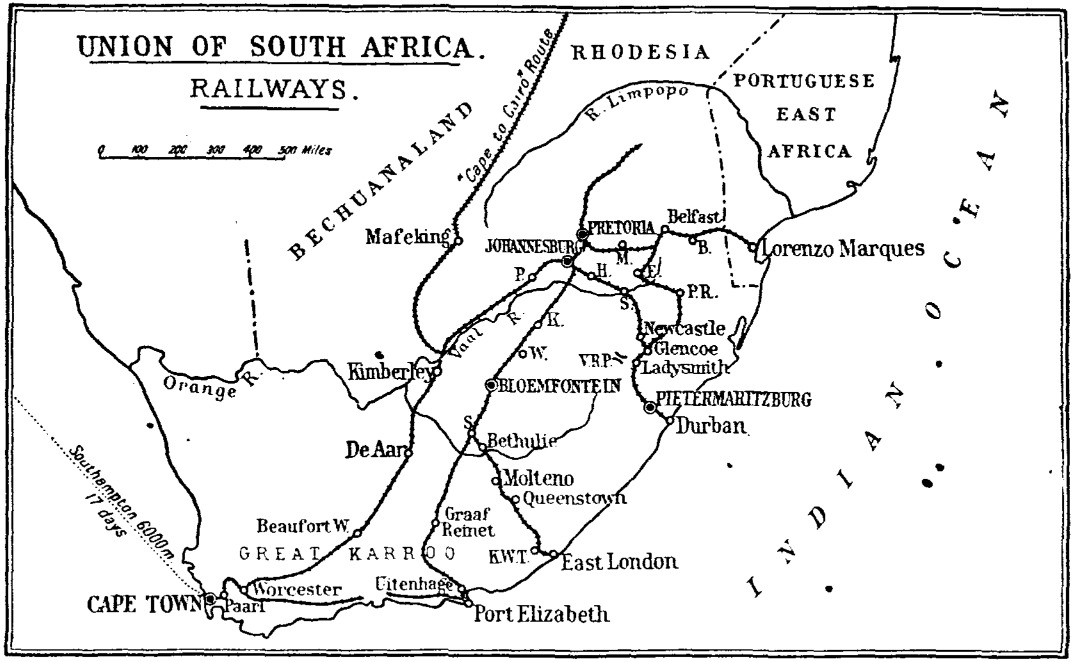
1. Through the exceptionally well-irrigated and productive agricultural district of *Potchefstroom*, the rich diamond-mining district around *Kimberley*, the pastoral region around *De Aar* Junction, the sheep, goat and ostrich farms of *Beaufort West* on the Great Karroo, the fertile orchards and vineyards of *Worcester* and *Paarl*, and the magnificent scenery of Hex River Valley to *Cape Town*. This is the Royal Mail Route from the gold and diamond fields

to the Cape, and connects with the projected "Cape to Cairo Route" just to the north of the Vaal River.

2. Through the pastoral and mining district of *Kroonstad*, the fruit-growing and horse-rearing district of *Winburg* to *Bloemfontein*, the provincial capital of the Free State and centre of a good cattle and dairy-farming district. *Graaf Reinet*, the largest and richest farming centre of the Great Karroo, *Uitenhage*, with its market gardens, wool-washing establishments and railway works, and *Port Elizabeth*, are also on this main line, and a branch from Bloemfontein to Kimberley connects with the previous route. Another from *Springfontein* crosses the Orange River at *Bethulie*, where possibilities of irrigation should encourage agriculture, and passes through the coal-mining district near *Molteno*, the sheep, cattle and ostrich farms near *Queenstown*, and the productive farming districts around *King William's Town* to *East London*.

3. South-eastward through the mining and farming country around *Heidelberg*, the pastoral *Standerton* district, the difficult Drakenberg passes near the historic *Laing's Nek* and *Majuba Hill*, the coal-mining country around *Newcastle*, and the important railway junction of *Ladysmith*, famous for its siege, to *Pietermaritzburg*, the capital of Natal, in a farming district half a mile above sea-level. The line then crosses the hot, low coastal plain with its plantations of tea, sugar, bananas and pineapples, to *Durban*. An important branch runs from Ladysmith over Van Reenen's Pass into the Free State, connecting with Route 2 at Kroonstad and Bloemfontein.

4. Through *Pretoria*, the capital of the Transvaal and administrative capital of the whole Union, in a fertile agricultural district also suitable for cattle, with diamond and iron mines, railway works and other factories, *Middelburg*, the richest coal-mining district in the colony, and *Barberton*, the centre of


UNION OF SOUTH AFRICA.
RAILWAYS.
0 100 200 300 400 500 Miles
RHODESIA
PORTUGUESE
EAST
AFRICA
BECHUANALAND
"Cape to Cairo" Route
R. Limpopo
INDIAN OCEAN
Mafeking
PRETORIA
JOHANNESBURG
Belfast
B.
M.
H.
P.
E.
P.R.
S.
Lorenzo Marques
K.
W.
V.R.P.
Newcastle
Glencoe
Ladysmith
Kimberley
Vaal R.
Orange R.
BLOEMFONTEIN
PIETERMARITZBURG
Durban
S.
Bethulie
De Aar
Molteno
Queenstown
Graaf Reinet
Beaufort W.
GREAT KARROO
K.W.T.
East London
Southampton 6000m.
17 days
Worcester
Uitenhage
CAPE TOWN
Paarl
Port Elizabeth
Fig 30

rich gold-fields, to *Lorenzo Marques*, a Portuguese port on Delagoa Bay. A branch runs from this line at *Belfast*, a coal-mining centre, through the rich agricultural and pastoral *Ermelo* district, and the rich fruit and tobacco farms of *Piet Retief*, to the coal-mining district of Natal, connecting with Route 3 at *Glencoe*.

Besides these main routes there is a considerable network of railways serving the rich agricultural and fruit-growing districts behind Cape Town, and a line along the coastal plain, with only one short break, to Port Elizabeth. Lines also run north and south along the coast of Natal from Durban.

Of all the routes from Johannesburg to the coast, that to Cape Town is the longest; but as this is the nearest port to England, with which country most of the trade is carried on, and is consequently the port of call of the fast mail boats, it secures most of the trade of the great mining capital.

The colony has over 15,000 miles of telegraph line, and there are now wireless stations at Cape Town, Durban and Johannesburg.

Commerce and Seaports

Practically the whole of the *exports* of the Union of South Africa are various raw materials, the produce of its mines, pastures and farms. Their total value amounted in 1913 to over 66 million pounds, there having been a steady increase in the total during the previous five years. Over half the total was made up by exports of *gold* from the Transvaal, and nearly a fifth by *diamonds* from the Cape Province. *Wool* to the value of six million pounds was exported, and almost three million pounds' worth of *ostrich feathers*. *Hides and skins, coal, mohair* and *copper* were next in order of value. *Tin ore* and *wattle bark* for tanning were also exported in considerable quantities, while *whale oil, tinned lobster, maize, fruit, tobacco* and *wines* also figure in the list.

Ninety per cent. of the total went to the United Kingdom.

The value of the *imports*, which has also been steadily increasing for several years, was in 1913 almost 42 million pounds, and, while consisting mainly of manufactured articles, the imports included seven and a half million pounds' worth of *foodstuffs*, home-grown supplies of wheat and flour, meat, butter and cheese, tea, coffee and sugar being still insufficient. The goods imported in largest quantities consist of various *textiles and clothing*, *iron and steel goods*, including mining machinery and agricultural implements, *boots and shoes* and other leather goods, *timber*, *drugs and chemicals*, *books*, *stationery* and *furniture*. Just over half the total came from Great Britain, and a third from foreign countries, the United States and Germany having the largest shares; while Australia, India, and Canada supplied a tenth of the total between them, contributing various foodstuffs and timber.

The trade is shared by the four seaports of Cape Town, Durban, Port Elizabeth and East London.

Cape Town, the capital of Cape Colony and seat of the Union Parliament, is delightfully situated on Table Bay at the northern foot of Table Mountain, which shelters it from south-easterly gales. The harbour has been improved by the construction of a breakwater, which is most effective in the winter months when the Roaring Forties blow strongly from the westward into the Bay. Docks and wharves have been built under its shelter. It is the outlet for the rich fruit-growing district in its immediate neighbourhood, and the growth of vines has given it a wine industry. Most of the gold of Johannesburg and the diamonds of Kimberley find their way by the great railway route to Cape Town, for export by the fast mail steamers of the Union Castle Line, which accomplish the 6000-mile journey to Southampton in seventeen days, calling at one or more of the island

groups of the Atlantic en route. It is also a port of call and coaling-station for several British lines, which go by the Cape Route to Australia and New Zealand, the next port, Fremantle, or Albany, being more than 4000 miles away. It has also fishing and whaling fleets, and large sailing-ships, which journey across the Southern Ocean in the track of the Roaring Forties, may often be seen in the port. On False Bay, behind Table Mountain, lies the naval dockyard and coaling-station of *Simon's Town*, an important strategic base on this great southern route.

Durban has the best natural harbour in South Africa, being protected from the gales of the South-East Trades by a sandspit almost enclosing the harbour. It is, however, somewhat shallow, and needs dredging to keep the entrance channel clear. It has another advantage over Cape Town in the easily available supplies of coal for shipping, but it is a three days' longer voyage from England. Being the nearest British port for the Transvaal and the Free State, it exports hides and wool from the veldt and coal from the Transvaal mines, as well as the produce of Natal. Coal is sent to Bombay, Mauritius, Singapore and Colombo, as well as to other African ports. Durban also receives imported goods for the two inland provinces, and has a considerable *entrepôt* trade with Portuguese East Africa and Mauritius.

Port Elizabeth has a fair harbour on Algoa Bay, but is very exposed to the south-easterly gales in summer. It is connected with Cape Town by boat and rail, and is one of the busiest centres in the colony, having many miscellaneous manufactures. It is connected by railway with the karroos and the veldt, and is the greatest centre for receiving, sorting, packing and exporting the wool, ostrich feathers, mohair, hides and skins from these districts.

East London has a fairly good harbour made by dredging the mouth of the Buffalo River. It is in a very fertile and productive agricultural district,

and is connected by rail to the rich pastoral districts of the eastern karroos and the Cape collieries in the Stormberg Mountains, so that its trade should increase.

CHAPTER XXVIII

UNION OF SOUTH AFRICA (*continued*)

POPULATION AND GOVERNMENT

Density—Native Races—Government

THE total population of the Union is just about six million, giving an average density of 13 to the square mile. Cape Colony is the most thinly peopled province, having a density of only 9, owing to the dryness of vast areas in the west. Natal, the best-watered province, has 34 people to each square mile, the Transvaal 15 and the Orange Free State 10.

Owing to the largely pastoral nature of the country, there are few towns of any considerable size, but Johannesburg, situated on the gold-fields, has grown from a collection of huts to a large modern city of 120,000 inhabitants in thirty years. Durban has just over and Cape Town and Pretoria each just under 30,000 people, while only eight other towns in the Union exceed 10,000 each. The value of permanent supplies of drinking-water in fixing the sites of towns and villages in a dry country, is shown by the large number of places whose names include the word "spring" or "fontein." In the dry season large numbers of the pastoral population lead a nomadic existence, following their flocks and herds from pasture to pasture in their trek carts.

NATIVE RACES

A striking feature of the population of South Africa is that the coloured races outnumber the

Europeans by four to one, there being four million natives and nearly another million of Hindus and Malays. In Cape Colony four-fifths, in Natal eleven-twelfths, in the Transvaal three-quarters, and in the Free State two-thirds of the total population are coloured. Not only is this the case, but recent statistics show that the coloured races are increasing at a greater rate than the whites, which is just the opposite to the case in Canada, Australia and New Zealand, where, with the possible exception of the Maoris, the natives are fast dying out before the approach of the white man.

Most of the natives are of the Bantu race, of which the Swazis, Zulus and Basutos are subdivisions. They are generally included in the term Kaffirs. They have the characteristic negro features, but are strong and well-built. They make excellent fighters, and at one time gave much trouble to both Boers and British, although armed with only clubs, assegais and cowhide shields. Their tribes are well organised, and in their own countries they are mainly pastoralists, keeping herds of cattle, sheep and goats. They also grow mealies and Kaffir corn (maize and millet), which they grind between stones into a meal with which to make porridge or cakes. They build beehive-shaped huts of cane and skins in a stockaded enclosure, or kraal, into which the animals are driven at night as a protection against wild beasts and other enemies. Many of them are now employed as servants or farm labourers by the white farmers, and thousands work in the compounds of the gold and diamond mines. They also seem capable of doing unskilled factory work, and, as they work well and cheaply in all these employments, there is little demand in South Africa for unskilled white labour. So that this colony hardly competes at all with Canada and Australia as a field for emigration, although there are undoubtedly openings for farmers with capital and adaptability. The Britisher must, however, be willing to learn both

Cape Dutch and the native languages if he is to succeed.

In the western parts of Cape Colony, on the borders of the Kalahari Desert, there still remain a few of the more degraded native Bushmen and Hottentots. The former are a stunted, yellowish-brown tribe of nomadic or cave-dwelling hunters, living on roots, insects, wild honey, and the flesh of animals killed with poisoned arrows. Their language consists of a most elementary series of clicks, and, like the Australian Bushmen, they seem uncivilisable. The Hottentots are slightly more advanced both physically and intellectually and keep herds of cattle, although they know nothing of agriculture. As with the Bushmen, however, contact with the white man has proved fatal, and they are fast dying out.

Some fifty years ago large numbers of coolies from the Malay States and from India were introduced into Natal, mainly for work in the subtropical plantations of tea, sugar and bananas. They usually signed on for terms of five years, at the end of which time many of them became free and took up their own farms. But the Indian Government has now forbidden further recruiting under this system. The experiment with Chinese labour was referred to in connection with the gold-mining industry.

Government

The colony is governed by the Governor-General, appointed by the King, assisted by a Senate and a House of Assembly. The Senate consists of forty members, eight elected by each of the four provinces, and eight nominated by the Governor-General. Each Senator must be a British subject of European descent, and have lived five years in the colony. Four of the nominated members are appointed for their knowledge of native affairs. The House of Assembly is elected by the provinces in proportion

to their population, and each member must also have the qualification named above. Elections are at least quinquennial. The Governor-General is assisted in the Administration by an Executive Council, consisting of the Prime Minister and ten others, including ministers of Native Affairs, Mines and Industries, Railways and Harbours, Public Works, Posts and Telegraphs, Agriculture and Lands. Parliament meets at Cape Town, but the Administrative Government Offices are at Pretoria. Dutch and English are the official languages, and are taught in the schools.

CHAPTER XXIX

BRITISH CENTRAL AFRICA

Physical Features—Climate and Vegetation—Industries and Productions—Communications—Commerce—Population—Government.

THIS consists of the *Bechuanaland Protectorate, Rhodesia* and the *Nyasaland Protectorate.*

PHYSICAL FEATURES.—Physically this territory is all part of the great Central Plateau of Africa, and few parts are less than a mile above sea-level. As the country lies almost entirely within the tropics, this is an advantage, as it reduces the mean temperature and makes the climate more healthy, so that Europeans can live comfortably in most parts. The general level of the country is broken here and there by higher ridges, the most important being that which includes the Matoppo Hills, and crosses Southern Rhodesia from Buluwayo to Salisbury. This is somewhat similar to the Witwatersrand in the Transvaal and is rich in gold, at present the most valuable product of the colony. The rivers are not of great use for navigation, their courses being frequently interrupted by rapids, although certain stretches, especially

of the Zambesi above the celebrated Victoria Falls, are useful for internal communication. Lake Nyasa is a fine waterway, upon which regular services of steamboats have been established. Its outlet, the Shiré, is only broken by one stretch of rapids, and forms a valuable line of communication to the Zambesi delta and thence by the Chindé distributary to the sea. Steamers can ascend the Shiré to Port Herald. The lake lies in a great depression or Rift Valley, the eastern shores rising steeply about 10,000 ft. above it and the western about 5000 ft. to the plateau.

Climate and Natural Vegetation. Lying within the tropics temperatures are always high, although modified by the elevation of the plateau. Few places have an average temperature below 60° F. for the coldest month; while only in the lower parts of the Zambesi Valley does the average for the hottest month approach 80° F. The approximate equality of days and nights throughout the year keeps the range between summer and winter temperatures small. Clear nights on the plateau are often very cool and even frosty.

The prevailing winds are the Trade Winds from the Indian Ocean, and the wettest parts are, therefore, in the east. Nyasaland and Northern Rhodesia get more than forty inches of rainfall per annum, while the western parts of Bechuanaland get very little and form part of the Kalahari Desert. Nearly all the rain falls in the hottest months, *i. e.* from November to March, and thunderstorms are fairly frequent. The quantity of rain often varies very considerably from year to year, and only light showers are ever experienced in the winter months.

The climate on the plateau, then, is very healthy, but the river valleys are enervating swamps infested with mosquitoes, tsetse-fly and similar unwelcome insects, which spread malaria and other diseases fatal to men and beasts. The long droughts do not favour

the growth of forests, and the country is mainly of the savanna type, fine open grass land with clumps of trees here and there, especially along permanent watercourses, similar in appearance to an English park, although the trees are quite different. Large herds of grass-eating animals, such as antelopes, gazelles, zebras and giraffes, live on these savannas and are preyed upon by lions, jackals and other carnivorous beasts, which provide sport for the big-game hunter. In the lower and more densely forested river valleys elephants are hunted for their ivory, and the rhinoceros and hippopotamus live along the banks of the Zambesi and other rivers.

Towards the west, and in Bechuanaland, the country becomes more steppe-like and the pasture poorer, but in the regions free from the ravages of the tsetse-fly and rinderpest the natives keep large herds of cattle.

Industries. 1. *Forestry* employs considerable numbers of natives in tapping *rubber*-trees and collecting a drug plant known as *strophanthus*, or in trapping the elephant and rhinoceros for their *ivory* tusks and horns. Collecting *beeswax* also gives rise to another distinctive export of Nyasaland, in which protectorate and the adjoining parts of Northern Rhodesia most of the forests are situated. The forests also supply sufficient timber for use in building and mining.

2. *Pastoral industries* employ most of the natives of Bechuanaland and many in Rhodesia, and with the abundant natural pasture and the increase of large mining communities in these and neighbouring countries it would seem that there are good opportunities for European settlers to take up this type of farming, especially if new breeds of cattle are introduced and precautions taken to prevent the spread of cattle diseases from the unhealthy lowlands to the high and healthy plateau.

3. *Agriculture* of a primitive kind has always been carried on by the natives, who grow their own sup-

plies of *mealies* and *millet*, which they grind in stone hand mills to make flour for their porridge and cakes. The climate is most suitable for the growth of *maize*, which could be grown for export, but owing to the summer rains, wheat, if grown at all, must be ripened off in the winter. European settlers have now laid out plantations of *tobacco* and *cotton*, both of which seem to thrive and are exported from the hotter and wetter north-eastern regions. *Coffee* and *chillies* are cultivated in Nyasaland. The former was at one time the chief crop of the Protectorate, and had a high reputation for its quality. Indeed, the coffee plant became the badge of the colony. But droughts and pests have played havoc with the plantations, as in Ceylon, and many of them have been ploughed up for other crops yielding more certain returns. The area under *tea* is increasing.

4. *Mining* is the most valuable industry of the region. *Gold* is the chief mineral worked at present, nearly £3,000,000 worth being exported from Rhodesia in 1913, accounting for four-fifths of the total exports of the country. It occurs throughout the ridge running from Buluwayo to Salisbury, and in many parts is still worked by miners on a small scale, although the larger and more expensive processes are being introduced. Ruins of ancient workings and cities are found in this district, which is the scene of *King Solomon's Mines*, in fiction if not in fact. *Coal* exists of excellent quality and in large quantities, being chiefly mined at present in the Wankie district to the south of the Victoria Falls on the Zambesi. It is of considerable value in the working of the railways which have been laid down to develop the country, and particularly of the Rhodesian section of the "Cape to Cairo" route. *Iron ore*, *silver*, *lead*, *diamonds* and several other minerals are also worked.

5. *Manufacturing* as understood in England is non-existent, although the natives have long understood

the arts of pottery and of weaving cloth on hand looms from the wild cotton. But until the European population becomes very much larger than at present, the necessary textiles for clothing, machinery for mining and railways, and miscellaneous manufactures will continue to be imported in exchange for the agricultural and mineral products of the colony.

Transport and Communication. The *river valleys* and the *rivers* themselves are the most used lines of internal communication, but falls and rapids lessen their value as means of communication with the outside world. The Shiré outlet of Lake Nyasa is the most valuable of these routes. In the riverless districts one or two passable *carriage roads* have been constructed, notably the Stevenson Road from Karonga on Lake Nyasa to Abercorn on Lake Tanganyika, and there are numbers of *native tracks* across the savannas and through the forests. Owing to the absence of suitable beasts of burden and the difficulties of traversing forested areas crossed by many streams, *human porterage* has always been the commonest means of transport, the natives carrying enormous loads on their heads. Before the advent of the British, this work was always carried out under conditions of slavery, the weaker tribes being enslaved by the stronger. But to develop the country on a modern commercial basis needed the construction of *railways*, especially as the whole area has no seaport. The *Cape to Cairo Route* has been continued northward from Mafeking through Bechuanaland, which was taken under British "protection" mainly for this purpose, to Buluwayo. It then strikes north-west towards the Victoria Falls on the Zambesi, crossing the Wankie Coal-field and being carried over the Zambesi gorge, 100 yards wide and 400 feet deep, by a fine steel bridge within sight of the Falls. Livingstone, named after the discoverer, and the administrative centre of Southern Rhodesia, lies at the northern end of the bridge, and is also a centre for the tourists who

come to see the great natural wonders of the Falls, where the river, over a mile wide, suddenly plunges into the deep, narrow and richly forested chasm. The route then continues through North-Western Rhodesia, and reaches the copper mining centres in the south-east corner of the Belgian Congo. Its further continuation is undecided, although it is most likely that it will be carried across North-Eastern Rhodesia at least as far as the southern end of Lake Tanganyika.

A most important branch leaves this route at Bulu-wayo, traversing the rich gold-mining districts to *Salisbury*, the capital of Rhodesia, and then proceeding through Portuguese territory to the port of *Beira*, which is the chief outlet of the colony and the place at which over half the imports are landed. Smaller branch lines run to other mining centres in the colony from this route.

A short railway connects *Blantyre*, the largest settlement in Nyasaland, to *Port Herald*, the limit of steamer navigation on the Shiré, and it is proposed to carry this line northward through *Zomba*, the administrative centre of the Protectorate, to *Fort Johnston*, on Lake Nyasa, and southward to the Zambesi, as the Shiré is becoming silted up and difficult for navigation.

Commerce. The commerce of this region is at present very small, and Southern Rhodesia has by far the largest share, Salisbury, the capital, and Buluwayo being the busiest centres. The country suffers from the lack of a seaport, but arrangements have been entered into with the Portuguese Government by which Beira has become, to all intents and purposes, the seaport of the colony. • In 1913 the exports of Southern Rhodesia were valued at three and a half million pounds, four-fifths of the total consisting of gold. Iron ore and tobacco were the only other items of considerable value. *Northern Rhodesia* exported about a quarter of a million pounds' worth of produce, consisting mainly of *rubber*, *cotton* and

tobacco. The exports of *Nyasaland* were of about the same value, *cotton* accounting for a third and *tobacco* a quarter of the total. Other items were *rubber, coffee, beeswax, chillies* and the drug *strophanthus.* The imports in every case consist mainly of manufactured textiles, hardware and provisions. Most of the trade is with the Union of South Africa and the mother country.

Population and Government. The population of the region consists of about three million natives of various Bantu tribes and some twenty-five thousand Europeans, mainly British. The natives maintain their tribal system and live in kraals, keeping cattle and growing mealies and Kaffir corn for food. Some now work on the plantations of the white settlers and in the mines. Rhodesia is administered by the British South African Company, which holds a charter from the Crown, who appoints a High Commissioner. Bechuanaland and Nyasaland are protectorates governed by the Colonial Office through a High Commissioner and a Governor respectively, representing the King. The tribal chiefs have considerable power in their own districts, being assisted by a Resident Commissioner to keep order and develop the resources of their country. There are native police forces officered by Europeans, and life and property in British Central Africa are now comparatively safe. The education of the natives is undertaken by various missionary societies, which receive slight assistance from the Government.

The country will probably never become a white man's land, but is capable of much greater development as a tropical dependency under British control.

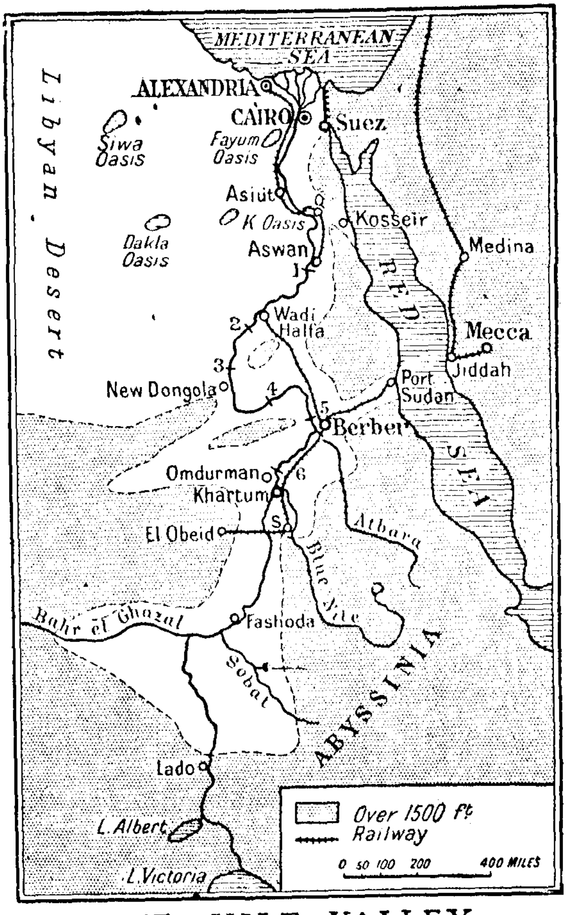
CHAPTER XXX

EGYPT AND THE BRITISH SUDAN

The Importance of the Nile—Climate—Industries—Methods of Irrigation.

PHYSICAL FEATURES

THIS country practically consists of all that part of the *Nile Valley* that lies less than 3000 ft. above sea-level, and contains all the navigable portions of the river, with which the economic life of the whole region is inseparably linked. Draining Lakes Victoria and Albert, the river falls steeply over many rapids from the Great Central Plateau, and, reinforced by the Ghazal and Sobat tributaries, spreads to almost lake-like proportions in the more level country of the Sudan. But here, on account of the great heat and moisture, vegetation is so rank that the river is choked by masses of tangled reeds known as *sudd*, through which specially constructed steamers are employed to keep open a navigable channel. Proposals have been made for using the matted sudd material for fuel, and a clearance of this area, if possible, would set free much water, which would be of incalculable value for irrigation lower down the river. From Fashoda to Khartoum the river is a broad navigable highway through a drier steppe-like country, with groves of date palms along the river side. At Khartum and Berber respectively the river is joined by the Blue Nile and the Atbara, the two large tributaries which collect the melting snows and heavy monsoon rainfall of the Abyssinian Highlands, pouring their floods into the main stream at the hottest time of the year, and bringing about the yearly miracle of the ancients, the summer floods of the Lower Nile, upon which their very livelihood depended. For below Berber, for 1800 miles, the Nile is the one source of water in an



THE NILE VALLEY

FIG. 31.

otherwise waterless desert, and only along its banks and on the fields reached by its floods is a settled life possible. The low, flat strip of habitable country

in no place exceeds ten miles in width, and is enclosed on either side by the steep and barren rock walls, often exceeding 1000 ft. in height, of the desert plateau which fills most of the country. It is in this region that the irrigation works, to be described later, have done so much for the life of Egypt.

The larger towns are situated at or near those points where the navigation of the river is impeded by "cataracts," or rapids, caused by the outcrop of sills of harder rock across the country. The necessary transhipment of cargoes at these points gives employment to numbers of porters. The positions of Aswan, Wadi Halfa, New Dongola and Berber should be noted in this connection.

The strip widens out at its northern end, where the accumulated silt of centuries has built out into the Mediterranean Sea the huge delta which, first named by the Greeks on account of its resemblance in shape to their letter delta (Δ), has given its name to all similar river formations in other parts of the world. Two of the distributaries of the river through the Delta are kept navigable for small steamers, and are known from the towns at their exits as the Rosetta and Damietta mouths respectively. But owing to the fertility of its soil and the facility of irrigation, the great importance of the Delta is that it is the largest compact area of inhabitable land in the country, and Cairo, commanding all the lines of communication across it and from it to the rest of Egypt, naturally became the largest city and capital of the country.

As the Nile was, and is, the chief means of livelihood to the dwellers on its banks, so it was, and is, the chief means of communication between the communities that have grown up at several points. Old roads and the modern railway run within sight of the river, for although the line from Wadi Halfa to Berber cuts off the great Dongola bend of the river, lines are now being constructed along even this section of the stream.

After the Nile, the only other physical features of economic importance are the few depressions in the Libyan Desert, at distances varying from one to two hundred miles from the lower course of the river. Here natural springs have given rise to *oases* where pasturage and cultivation are possible, and settlements have sprung up. The chief of these oases are Siwa, Farafra, Dakhla and Kharga. The large, valuable and celebrated depression of Fayum is irrigated from the Nile itself, the first canal having been cut ages ago, some legends ascribing it to Joseph the Israelite. Apart from these oases, the rest of the country is a barren wilderness of sandstone and sand dunes, crossed by the few tracks of the camel caravans that trade between oasis and oasis.

Two relatively low depressions in the plateaux of the Arabian and Nubian Deserts give access from the Nile Valley to the Red Sea, one being crossed by the old road from Kina to Kosseir, along which are famous stone quarries, and the other by the railway from Berber to Port Sudan, which is the best of the few poor harbours along the high and comparatively unbroken Red Sea coast. The lowness of the strip of land separating the Mediterranean and Red Seas, and the existence of the Bitter Lakes, facilitated the construction of the *Suez Canal,* which runs at sea-level from Port Said to Suez, no locks being necessary. The Mediterranean shores are low and sandy, and the water is shallow. The harbours at Alexandria and Port Said are both artificial.

Climate. The climate of Egypt can be summarised as very hot and dry, the absence of cloud making the days intensely hot, while the nights are often very cool and even frosty. At Aswan the mean temperature for January is 62° F. and for July 92° F., while the mean annual rainfall is less than one inch. Only along the Mediterranean

shores is there ever any appreciable quantity of rain, and that falls mainly in the winter months. The mean annual rainfall of Alexandria is only 8½ in.; but in a country where the mean temperature is so high and evaporation consequently great this is of little account, and vegetation is only possible where it can be supplemented by irrigation.

But further south in the Sudan, although temperatures are higher, there is a distinct wet season in the summer months, when the hot, wet equatorial rain belt moves northwards towards the tropic of Cancer. The southern parts of the Sudan receive on an average over 40 in. of rain between May and September. The long winter drought, however, makes it difficult for tree growth except along the courses of the rivers and streams, and the vegetation is consequently of the park-like savanna type. The summer rains are strengthened by the monsoon effect caused by the strong indraught of moist air from the relatively cool waters of the Indian Ocean, towards the intensely heated desert region to the north. This causes the Abyssinian tributaries of the Nile to be in full flood towards the end of the summer months, the flood being highest at Wadi Halfa at the beginning, and at Cairo at the end, of September.

The warm, dry, sunny winters of Egypt are giving it a considerable reputation as a winter health resort for dwellers in the British Isles and the north of Europe.

Industries

Forestry is an unknown industry in Egypt, as there are no trees save isolated groves of date palms. But in the Sudan, around the headwaters of the Nile and its tributaries, are extensive and valuable forests. In the drier parts, where the trees accommodate themselves to long periods of hot drought,

by producing a gummy, instead of a watery sap, the chief economic product is *gum arabic*, which is collected from the trees and exported for use in making adhesive substances, and also in medicine. It forms a third of the total exports of the Sudan, Kordofan being the province from which the largest quantities are obtained.

Ivory, the third largest export, is obtained from the elephants that roam the hotter and wetter forests and savanna lands to the south. The hard kernels of a species of palm yield a sort of *vegetable ivory* used in making buttons.

Ground-nuts, senna leaves and other drug plants are also collected in the forests for export.

The forests around the Bahr el Ghazal produce *rubber* of good quality, and also *bamboo* and *ebony*.

Pastoral industries are also becoming important in the Sudan, where the natives keep large herds of cattle on the savannas and poorer grass lands, and the Government is giving attention to the improvement of the stock and the prevention of various cattle diseases. *Camels* are reared in the oases for the desert traffic, and the Egyptian *donkey* is quite a characteristic feature of the towns. A few *ostriches* are kept in parts of the Sudan, where the bird is native, and ostrich feathers are exported in small quantities.

Agriculture. The Egyptians have always been great agriculturalists, and this industry directly employs more than three-fifths of the total adult population. About half of them own and till their own plots, much the larger number owning areas of less than one acre and comparatively few owning more than fifty acres of land. With all, the great problem is irrigation. Given this, the fertile soil and hot sunny climate make it possible to raise three different crops a year from the same field. *Irrigation* is either perennial or periodic. The first is only possible to those who live directly alongside

the river or one of the canals that have been constructed to lead off water from it. The " fellah " is then able to raise water by a " shaduf," or arrangement of bucket and weighted pole, to the level of his fields as and when required, or in the more elaborate modern system, to take water from the canal through sluices. Under this system crops of *sugar, rice* and *cotton* can be grown in the hotter months, and *maize*, *wheat*, *barley*, *clover* and various vegetables at other times. This perennial irrigation has been practised in the Delta, the Fayum depression, and the easily irrigated districts of the Lower Nile for many years, and the aim of the construction of the great irrigation works on the Nile by the British Government has been to bring larger and larger areas under this system of cultivation, so that the country may carry a larger population under conditions of surer and greater comfort. The chief feature of the work has been the construction of the Great Dam at Aswan below the first cataract, which is over a mile long and 130 ft. high, and impounds an enormous reservoir of water that can be used for irrigation long after the floods have subsided. A series of five locks has also been constructed alongside the dam to overcome the impediment to navigation. Smaller " barrages " have been constructed at Assiut, Esna and Zifta, lower down the river, to regulate the distribution of the water.

Above Aswan, and still in some parts below it, the old " basin " system, dependent upon the floods, is very common. This consists in allowing the flood waters to come over the banks into the walled-off fields and remain till the river subsides, leaving behind it a deposit of fertilising mud in which the seeds are planted; *wheat, durra,* a kind of millet, and vegetables being the chief crops. This system has several obvious disadvantages, the greatest being its absolute dependence on the flooding of the Nile. For when the flood is below average.

those fields farthest from the river will get no water at all, while exceptionally high floods sometimes do more harm than good. The land is also useless while under water, and therefore fewer crops are possible than under the perennial system. Its great advantage is that it renews the soil each year, for the gradual impoverishment of the land, so intensively cultivated under the other system, is now making itself felt in diminished yields of several crops. Until recent years every Egyptian peasant was liable to be called out to work on the embankments of the Nile without payment; but this system, known as the corvée, is now abolished, although the natives may still be called upon to guard and repair the banks. In the drier parts of the Sudan, along the rivers, similar methods of irrigation are in use, although not on such a large scale.

Maize, millet, wheat and rice are the chief food grains of the people, and small quantities are exported. Egypt was at one time one of the great granaries of the Roman Empire. As in India, the wheat is a winter crop, the average temperature of the coldest month being about the same as that of an English July.

Cotton is grown principally for export, some 25 million pounds' worth, or five-sixths of the total value of Egyptian exports, being sent out yearly. Four-fifths of the cotton goes to Great Britain. With this crop the Egyptian farmer is able to purchase manufactured articles and luxuries from abroad, unobtainable by the fellaheen who are dependent upon the basin system of irrigation, as cotton is a typical summer crop. The Egyptian cotton has a fine long staple, and is almost as good as the best American product, and far superior to that of India. Cotton-growing is now subsidised by the Government in the Sudan, and is particularly promising in the tract of country between the Blue Nile and the main stream, where irrigation is easy.

Exports of cotton fibre and seeds are increasing steadily.

Date palms are cultivated along the rivers and in the oases in the drier parts of Egypt, and especially in the Sudan. They yield an abundant and valuable food supply, and small quantities are exported.

Mining is only carried on to a very small extent. There are, however, deposits of copper, gold and iron in various parts of the Sudan, which are worked by the natives and used in making utensils, weapons, implements and ornaments.

Manufacturing is also only carried on on a very small scale, there being a great lack of fuel. A discovery of petroleum near the Gulf of Suez may prove valuable. Many of the natives show considerable skill in the making of hand-made cotton, cloth, and leather goods. Cigarettes are made from home-grown and imported Turkish tobacco. Pottery and paper-making (from the papyrus reeds) are ancient Egyptian industries.

CHAPTER XXXI

EGYPT AND THE BRITISH SUDAN (*continued*)

COMMUNICATIONS, COMMERCE, GOVERNMENT

River and Railways—Suez Canal—Commerce and Seaports—History, Population and Government.

PRACTICALLY every known form of transport, from human porterage to modern railway, is in daily use in Egypt and the Sudan. The native *negro carriers* in the southern forests follow beaten tracks, marching in single file with bundles of rubber, ivory, etc., upon their heads, down to the nearest point on a navigable waterway, where Government steamers are ready

to transport the produce to the nearest market town. The porters can travel about fifteen miles a day. Further north long lines of *camels*, with bundles of dates or gum strapped to their backs, wind across the desert, bringing the oases into touch with the Nile, which is the great highway of the country's commerce. Fashoda, at the confluence of the Sobat, is an important collecting centre for all these products. Flat-bottomed *paddle-steamers* of shallow draught, owned by the Government, keep up regular communication between all places on the navigable stretches of the Nile and its tributaries, about 3000 miles of navigation being used in this way. The graceful native dahabeah, or one-sailed boat, is also a familiar feature on the river. From Khartum to Wadi Halfa and from Aswan to Cairo the waterway and camel road are supplemented by *railway*. This line is State property and, with branches, totals a length of about 3000 miles. Most of it is on the 4′ 8½″ gauge, but parts are still only 3′ 6″. There are several hundred miles of privately-owned railways of a light nature, mainly used for agricultural purposes. Most of these are in the Delta. The railway has been extended from Khartum, the capital of the Sudan, up the Blue Nile to the cotton-growing district of Sennar, and thence back to the White Nile and westward to El Obeid, the centre of the cattle-rearing, gum and date producing region of Kordofan. An exceedingly important branch runs from Berber, at the confluence of the Atbara, to Port Sudan on the Red Sea, and as this is the shortest outlet for the produce of the Sudan its importance will probably increase. Another branch runs from Abu Hamed, along the river towards Old Dongola. Cairo is connected by rail with Alexandria, the great outlet of the Nile Valley, and with the Suez Canal at Ismailia, whence lines run north and south along the Canal.

The Suez Canal has small direct local importance, but its great value to British commerce, as a link in the greatest sea route connecting the scattered parts of the Empire, has made the British occupation of Egypt essential to its security. This occupation has played such an important part in developing the country that Egypt really owes much to the Suez Canal. The Canal is controlled by a private company, in which the British Government is the largest shareholder, the dividends on its shares bringing more than a million pounds annually to the exchequer. The Canal, designed by the distinguished French engineer, De Lesseps, was opened in 1869. It is 87 miles long, some 21 miles in the middle being through the Bitter Lakes. There are no locks, and at ten-mile intervals along the canal are places where vessels may pass. It is not navigable for the largest vessels afloat, but the 13,000 ton vessels of the Peninsular and Oriental and other lines regularly pass through the Canal. Some 5000 ships, totalling about 20 million tons register and carrying some 200,000 passengers, pass through the Canal each year, and its importance to the Empire is shown by the fact that three ships out of every five are British. A fresh-water canal,

THE SUEZ CANAL

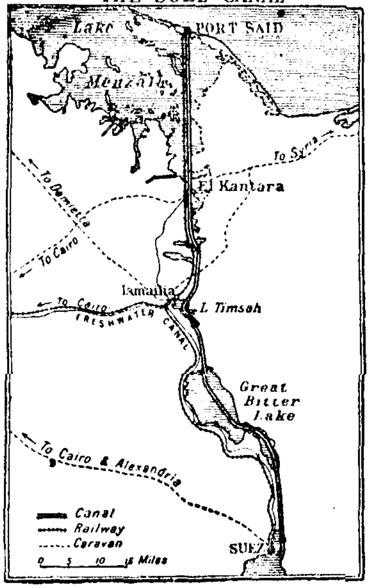


FIG. 32.

drawing its water from the Nile, runs along the whole length of the Canal, supplying drinking-water to the few towns along its banks. This had to be constructed in order to supply the labourers employed on the construction of the ship Canal.

Commerce and Seaports. Egyptian *exports* are valued at almost 30 million pounds a year, five-sixths of which are accounted for by cotton. The only other item of considerable value consists of cereals and oil seeds. Cigarettes are also exported. The exports of the Sudan are valued at about one million pounds annually, gum arabic, cotton, ivory and oil seeds being the largest items. About half the total exports of Egypt come to Great Britain, Germany and France, the next best customers in normal times being the United States and Russia. Great Britain receives about a third of the Sudan products direct, and most of the rest go to Egypt.

Egyptian *imports* are slightly less in total value than the exports each year, the principal items being textiles, mainly cotton and woollen goods, cereals and vegetables, coal and timber, metal goods, and various manufactured foodstuffs and sundries. Sudanese imports (worth about £2,000,000 annually) are similar, but also include large quantities of refined sugar, obtained from Egypt and India. Great Britain supplies about a third of the total imports to Egypt, including all the coal and most of the cotton goods. Turkey, France, India and Germany also have a considerable share in the trade. The Sudan obtains about half its requirements from or through Egypt, about a quarter from Great Britain, and most of the rest from India.

Practically the whole of the exports of Egypt and eight-ninths of the imports pass through *Alexandria*, which is consequently one of the great seaports of the Mediterranean. The reason for the concentra-

tion at this point is obvious from the shape of the hinderland, which is simply the long, narrow strip of the Nile Valley running inland from the port; the valley being not only the one productive area of Egypt, but also the single line of easy communication through the country. A good artificial harbour has been constructed, and a ship canal connects the port with the Rosetta mouth of the Nile. There is also rail connection with Cairo. It dates as a commercial centre from the time of its founder, Alexander the Great.

Rosetta and *Damietta*, at the exits of the two navigable distributaries of the Nile, are of relatively little importance, being much subject to silting up.

Port Said, as the coaling-station for ships using the Suez Canal, has a large *entrepôt* trade, although its own immediate neighbourhood is quite unproductive. The coal used is mainly sent out from Great Britain in colliers, and is conveyed to the liners in large lighters manned by crowds of noisy Asiatics of very mixed race.

Port Sudan has now supplanted *Suakim* as the chief port of the Sudan, and tends to become very important.

Kosseir is a small port, where a very ancient and still-used caravan route between the Mediterranean, the Egyptian oases and the Indian Ocean, reached the shores of the Red Sea. The Suez Canal has, of course, destroyed much of its ancient importance.

History, Population and Government

Recent researches, and the reading of inscriptions on ancient monuments and buildings unearthed in portions of the Nile Valley, seem to show that Egypt was inhabited by a civilised race of agriculturalists at least forty centuries before the birth of Christ. The richness of the land, due to the fertilising influence of the Nile, made it the envy of surrounding

peoples, and Assyrian, Persian, Greek, Roman, Saracen and Turkish conquerors entered the country and dominated it in turn. Under most of these the country still flourished, and in the time of Alexander the Great, about 300 years before Christ, his city of Alexandria was the intellectual and commercial centre of the western world. But the Turks, a nomadic, steppe-dwelling people, with no interest in agriculture, allowed irrigation works to fall into disrepair, as they have also done in Mesopotamia, and in three centuries of misrule reduced the country to a ruinous state. The British and French, having acquired an interest in the country through the construction of the Suez Canal, assisted the Khedive, the Egyptian ruler appointed by the Sultan of Turkey, to restore it to a more thriving condition. The British gradually secured a fuller measure of control over Egyptian finance and introduced great social, political and economic reforms to the lasting good of the country; and when, at the outbreak of the Great European War in 1914, the attitude of the Khedive threatened British interests in Egypt and the Suez Canal, it was finally annexed and became part of the Empire. The Sudan, which, to preserve Egypt from the attacks of its fanatical native tribes, had been brought under joint British and Egyptian control after the great victory at Omdurman in 1898, will now come more completely under British influence.

Most of the 11,000,000 inhabitants of Egypt belong, then, to the "White" or Caucasian race, and the higher classes, especially the Copts, have fine stature and features. The fellaheen, or poorer cultivators, have darker complexions and coarser features, and are of a shorter and heavier build than the average European. On the borders of the Sudan there is considerable mixture with the negroes, who are natives of that region.

The oasis-dwellers and camel-riders of the

desert caravan routes are nomadic, or half-nomadic, Bedouins of tall, slender build, with dark and swarthy faces. They are proud and independent, their struggle against the hardships of the desert having given them great self-reliance.

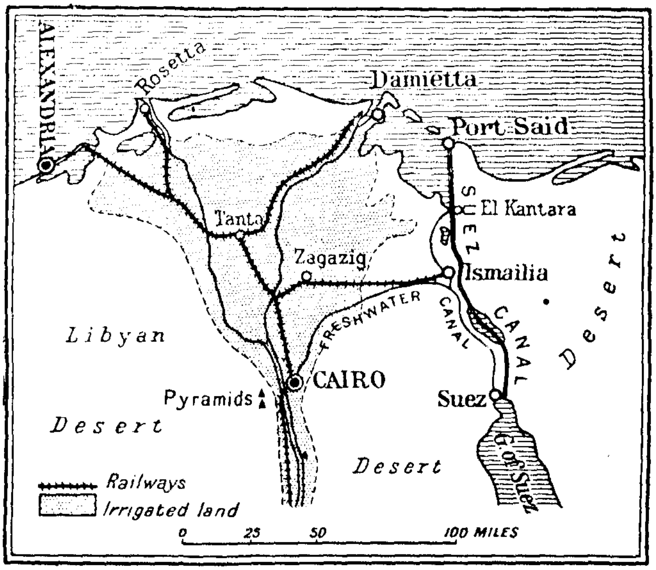
The pure Sudanese are typical negroes, with black skin, thick lips, projecting jaws, receding forehead and woolly hair. Some of the many tribes into which they are divided are mainly agricultural, cultivating maize and millet; while others are keepers of cattle; and some combine both occupations, carrying on their cultivation in the rainy season, and in the dry season moving with their animals to the fresher riverside pastures. In the southern forests, where various fruits supply abundant food, they collect and carry rubber, ivory and other forest products, which they can exchange for clothing, ornaments and other luxuries with European traders.

Lower Egypt, which practically consists of the Delta and the district along the Suez Canal, is the most thickly peopled, containing over half of the total population. Upper Egypt consists of the fertile irrigated strip of the Nile Valley as far south as Wadi Halfa. The two together cover an area of about 12,000 square miles, so that the average density of population is nearly 1000 to each square mile of habitable country. The 400,000 square miles of desert carry a nomadic population of less than 100,000 people. The British population number only about 21,000.

Cairo, the capital, with about 700,000 inhabitants, is the largest town, followed by *Alexandria* with over 300,000. No other town approaches 100,000 inhabitants, but seventeen towns have populations varying from 20,000 to 30,000. From what has been said above of the population of Lower Egypt, it will be seen that the *position of Cairo* is far more central as regards the population of the country

than its geographical position would seem to indicate, and this, with its control of all the land and water routes through the Delta to the Suez Canal and to Upper Egypt, has marked it out as the natural capital of the country.

Egypt is governed by the Khedive, who is ap-



LOWER EGYPT

FIG. 33.

pointed by the British Government and is assisted by eight native ministers and an elected Assembly; but the financial and military affairs of the country are entirely under British control. For the management of local affairs there are Provincial Councils in all the larger towns.

Ninety-two per cent. of the people are Moslems.

The three-quarters of a million Copts, descendants of the ancient Egyptians, and usually skilled craftsmen, often of considerable wealth, profess an ancient form of Christianity. The headquarters of the Church are at Alexandria. About 100,000 Europeans of various nationalities profess different forms of Christianity, and there is a considerable Jewish population.

The British problem in Egypt is, then, much the same as in India, although on a somewhat smaller scale, namely, to blend these various elements and to teach them, so that they may be able to govern and develop their country to the greatest advantage for themselves and the rest of the civilised world.

The million square miles of the *Sudan* are inhabited by some 3,000,000 natives, fanatical and almost uncivilised, divided into a large number of tribes, each owning allegiance to its chief. For the maintenance of order and the development of the country, the Sudan has been divided into thirteen provinces, each under the control of a British officer of the Egyptian Army. The administrative capital is *Khartum,* a town of some 30,000 inhabitants, situated at the confluence of the Blue and White Niles; the Blue Nile, laden with silt brought in its torrential course from the Abyssinian Highlands, the White Nile relatively clear after its filtration through the great lakes and by its slow passage through the Upper Sudan. At Khartum has been established an experimental and research farm, where the agricultural and pastoral possibilities of the country may be studied, so that its development may be along the right lines. Across the White Nile lies *Omdurman,* the largest town and old Dervish capital of the Sudan.

CHAPTER XXXII

BRITISH EAST AFRICA[1] AND UGANDA, ZANZIBAR, SOMALILAND

EAST AFRICA AND UGANDA

Physical Features. These British Protectorates consist of part of the great Central Plateau of Africa descending in terraces to the Indian Ocean. Running from north to south across the middle of the country is the remarkable Rift Valley, a depression in parts about a mile deep and some fifty miles wide, whose steep sides are thickly forested and at the bottom of which lie a number of lakes, mostly salt, through having no outlet to the sea. Lake Rudolf is typical. The Rift continues northward through Abyssinia, and the Red Sea and Jordan Valley of Palestine are probably a continuation of the same natural feature, which also extends southward through German East Africa[1] and contains Lake Nyasa. The faulting, or cracking, of the earth's crust and consequent sinking which produced the Rift, were probably accompanied by volcanic outbursts which have resulted in a number of extinct volcanic cones along the edges of the valley. Mount Kenia, which has the additional interest of being a snow-capped mountain on the Equator, was probably formed in this way. To the west of Uganda lies another similar Rift containing Lakes Albert and Edward, the sources of the White Nile. On the plateau between the Rift Valleys lies Victoria Nyanza, a fresh-water lake as large as Scotland and very useful for communication. From it flows another head stream of the Nile. The River Juba,

[1] As British territory in East Africa now includes the "Tanganyika Territory" (see Appendix), the older colony of British East Africa has been renamed "Kenya Colony."

which forms the north-eastern boundary, and the Tana, each give about 400 miles of navigable waterway for small vessels.

Climate and Vegetation. As the region lies across the Equator and in the belt of the Trade Winds, the climate is always hot and the rainfall in most parts sufficient, there being two well-marked rainy seasons about the times of the vertical mid-day sun. July, with a mean temperature of 77° F., is the coldest month, and March and November are the hottest, with mean temperatures exceeding 84° F. at Mombasa, where the wet seasons are from April to June and October to December.

But elevations varying from sea-level to the snow line afford opportunities for many gradations of climate and vegetation. The *low-lying coastal plain* is, in parts, densely forested, and mangrove swamps are found along the shores and river estuaries. *Ebony* and other tropical timbers and *rubber* are the most valuable economic products of this region; while *rice, coconuts, bananas, spices* and *sisal hemp* are also grown. *At higher levels, up to about* 5000 *ft., maize,* the chief native food grain, is extensively grown, and the growth of *cotton* for export is increasing, especially in Uganda and along the Juba River. Government grants have been made in aid of the cotton-growing industry. *Coffee* also thrives on the hot, moist and well-drained hill slopes, where the soil is good. There are also many plantations of *wattles* grown for their bark, which is used in tanning. *The higher parts of the plateau,* up to about 8000 ft., are suitable for most *English fruits and cereals,* and the savannas make excellent *sheep and cattle pastures.* The climate also makes this part quite suitable for British settlement, and a number of farmers have taken up estates there. But lions, hyænas and other "big game" still exist and must be guarded against. In some of the drier parts *ostrich farming* has been established. The

forests of this region also contain many valuable *timber* trees. The elephants of Uganda still provide *ivory*.

Communications and Commerce. Native porterage is still a common means of transport throughout the country, and the mail service from Entebbe, the capital of Uganda, to outlying mission stations and farms, is carried on by relays of native runners. Four Government steamers now ply regularly between ports on Lake Victoria, and there is another on Lake Albert and the navigable portion of the Upper Nile leading from it. But the main line of communication is the *Uganda Railway*, which runs from Mombasa through Nairobi, the administrative capital, to Port Florence on Victoria Nyanza. This brings down the cotton, hides and goatskins, maize, oil seeds, and ivory, which are the principal exports of the country, and distributes the cotton goods, provisions, machinery and agricultural implements, etc., which constitute the bulk of the imports.

There are some 2000 miles of telegraphs in British East Africa and over 1000 miles in Uganda, the latter also being connected through Gondokoro with the Sudan and Egypt. Regular lines of British, French, German and Italian steamships connect Mombasa and the ports of their respective countries via the Suez Canal, and there are also regular services to Bombay. Nearly half the total trade is with the United Kingdom, and the rest mainly with Germany, the United States and India.

POPULATION. Uganda, which is about equal in area to the British Isles, contains some three million people, and British East Africa, which is twice as large, about four million. The great majority are negroes speaking the Bantu language, but the Masai, a race of well-built, independent and warlike cattle keepers living on the plateau, are not pure negroes.

On the coast live the more indolent Swahilis, who, however, serve the Europeans as domestics. There are also some Arabs and Hindus. The former are descendants of the old slave-raiders, who advanced into the interior from Zanzibar and brought down the negroes in long slave trains to the coast, where they were sold for service in the plantations of India and elsewhere on the shores of the Indian Ocean. This trade disappeared with the advent of the British. The Hindus are the great commercial people of the Protectorate, and in this connection it is interesting to note that the current coin is the Indian rupee. There are about 5000 Europeans, mainly British.

Mombasa, the largest town, has about 30,000 inhabitants, of whom only about 100 are Europeans, as the climate is malarial. It has, however, a very fine harbour between the mainland and the island on which it is situated, and being the terminus of the Uganda Railway promises to become exceedingly important.

Nairobi, the capital and residence of the Governor, has a higher and more healthy situation half-way between Mombasa and Lake Victoria. It has a population of 14,000, including nearly 1000 Europeans.

Entebbe is the administrative capital of Uganda, and *Mengo* is the largest native settlement. The country has been cursed with sleeping-sickness, an epidemic disease which has completely depopulated whole districts, including several islands in Victoria Nyanza, which were once well peopled. The disease is spread by a species of fly, to exterminate which considerable efforts are now being made by British scientists.

Zanzibar, the old Arab slave and ivory market, once dominated the trade of East Africa, but it is now being surpassed by the British port of Mombasa and the German Dar es Salaam. It is now a British Protectorate, the Arab Sultan receiving a fixed salary, but having no control of the revenues of the island.

Zanzibar and the neighbouring island of Pemba are the chief sources of *cloves*, which account for a third of the total value of the exports. *Copra*, or dried coconut kernel, is another important export. The principal *imports* are *cotton goods* and *rice*. India has the largest share in the trade of Zanzibar, partly due to the fact that, as in East Africa, the chief traders are Hindus. Great Britain and British East Africa are the next largest sharers in the trade of Zanzibar. That the island still has an *entrepôt* trade is shown by the fact that the same types of articles figure in both the import and export tables, *e. g.* Zanzibar imports and exports ivory, rice, cotton goods and petroleum.

British Somaliland

This is, in reality, only a strip of coastal plain along the southern shore of the Gulf of Aden. It is a barren, waterless region, but the ports of *Berbera* and *Zeila* carry on a trade with the native nomadic Somalis, who find sufficient water and pasture for their herds of sheep, cattle and camels on the high plateau in the interior. The principal export of the region is, therefore, hides and skins, but some of the semi-desert trees also supply marketable quantities of medicinal and aromatic gums. These are exchanged for British textile goods, and rice and dates brought from India and Arabia via Aden to eke out the scanty food supplies. The trade is entirely conducted by camel caravans, which move from well to well. The Protectorate is controlled by a British Commissioner.

CHAPTER XXXIII

BRITISH WEST AFRICA

Physical Features—Climate—Industries and Productions—Communications and Commerce.

Our possessions along the shores of the Gulf of Guinea include Nigeria,[1] the Gold Coast[1] and its hinderland, Sierra Leone and Gambia; the first being about three times the size of the United Kingdom and the last only 4500 square miles in area.

Physical Features. Each of these territories consists of a narrow strip of coastal plain, which extends inland along the banks of one or more rivers to a low plateau some 2000 ft. above sea-level in the interior. The coast is singularly unindented and most of the year surf-beaten, and, as the river estuaries are mostly choked with sand bars or covered with mangrove swamps, harbours are few and poor. In some parts, too, the coast is fringed by lagoons enclosed by long sand bars, the one from which the port of Lagos probably takes its name being nearly 100 miles long and in parts several miles wide. As, however, the lagoon is deep enough for large ships, a channel is being cut across the bar to admit ocean-going steamers to the fine enclosed harbour. The best natural harbour on the coast is Freetown, at the estuary of the small Sierra Leone River, from which the Rokel gives forty miles of navigation inland. If kept clear of vegetation, the Volta and other rivers of the Gold Coast give some fifty miles of navigation for small vessels up to the rapids by which they descend from the plateau. The Gambia is navigable for more than 200 miles from the sea. The delta of of the Niger is a complete network of more or less navigable waterways, which, however, need constant dredging and clearing to be of any great value. The

[1] About a third of old German Togoland has now been added to the Gold Coast Colony, and a strip of the Cameroon Colony from the sea to Lake Chad has been added to Nigeria.

distributary of the Niger, at the mouth of which is situated the port of Akassa, is navigable inland to about 10° N. latitude, where it is interrupted by rapids, and its great tributary, the Benue, is navigable for small steamers throughout its course in Nigeria. These two rivers, and their many smaller tributaries, are the great natural highways of the country. The volume of the Benue tends to become very small, however, in the dry season.

Climate. Being so near the Equator the climate is intensely hot all the year round, the mean annual temperature in the coast districts being about 80° F. and never varying more than 5° F. above or below this in any month. The rainfall, too, except in Gambia, is very heavy, especially along the coastal strips, at many points of which it exceeds 100 in. a year. Most rain falls in the northern summer, when, under the influence of the vertical sun, the desert region to the north and the air above it become intensely heated. The South-East Trade Winds are then drawn across the Equator, and blow towards this low-pressure centre as a south-west monsoon. Coming off a hot ocean, they carry great quantities of moisture, which they deposit as they rise to the edge of the plateau. Much of the rain falls during violent thunderstorms, which are often of almost daily occurrence. The feature of the dry season in the "winter" months is the strong, dry, dusty North-East Trade Wind, or "harmattan," from the Sahara.

The great heat and moisture give rise to fever-haunted swamps and jungle which are most unhealthy to Europeans, and have given West Africa an unenviable reputation in this respect. But since it has been discovered that the most violent fevers are spread by certain species of mosquito, which can be destroyed or guarded against if suitable precautions are taken, and that careful living enables various diseases to be more easily resisted, the

country is losing its terrors. It will probably, however, never become suitable for permanent white settlement; but those who are sufficiently hardy, and willing to undertake the development of the rich resources of its plantations and mines, can secure a competence in a very few years.

INDUSTRIES. *Forestry.* Thick forests cover most of the lowlands and give sustenance to a large negro population, who live mainly on various fruits such as the banana and nuts of various kinds. Some tribes practise a primitive agriculture, growing maize, millet and other grains in the clearings. But the forests also contain valuable timber-trees, such as *mahogany, ebony, rubber-trees,* and, above all, the *oil palm,* the nuts from which provide the commercial *palm oil,* which is the *most valuable export* of *West Africa.* Many white traders are engaged in the exploitation of these products, and plantations of Brazilian rubber-trees and of oil palms have been laid out in suitable parts. Arrangements are made with the various chiefs for the recruiting and payment of the native labourers, who cut down the trees or collect the rubber and palm kernels, and spend the surplus wealth acquired in this way mainly in toys, ornaments and spirits. Large areas of native rubber-trees have been destroyed by careless tapping. The *elephant,* which figures with the oil palm on the official badges of several West African Colonies, is still a source of wealth, but the exports of ivory are diminishing. *Ground-nuts,* an important article of native food, are also exported from Gambia, and *kola-nuts,* used by the natives for chewing, are exported from Sierra Leone and the Gold Coast.

Agriculture. As has been stated already, the natives supplement the natural supplies of food-stuffs in the forests by cultivating various grains and roots. *Rice* flourishes in the swampy coast and delta lands, and *maize* and *millet* further inland, while in the drier interior *wheat* is also grown. *Cotton*

plants, which are native to the country, are now cultivated under European supervision, especially in Southern Nigeria; and as the fibre is of good quality and the British demand for cotton increasing, this industry has good prospects. *Cocoa* plantations are now the chief source of wealth of the Gold Coast, and the cacao also flourishes in the wetter parts of Southern Nigeria. *Coconuts, coffee* and *various spices* are also cultivated.

Pastoral industries are only important in Northern Nigeria, where the long, dry season prevents the growth of forest, and the vegetation is the park-like savanna typical of the Sudan. Here the strong and warlike Fula race of negroes keep herds of *cattle, sheep* and *goats*—the "morocco" leather of commerce being manufactured at Kano and formerly sent by camel caravan across the Sahara to Morocco. *Ostriches*, which are native to this region, are also kept, and their feathers form a small item of export.

Mining of *gold* and *tin* is increasing in importance. The old rocks of the plateau seem to contain valuable veins of these minerals, and their disintegration by the heavy rainfall of the district caused the sands of the rivers to be very rich in these metals, the rivers of the Gold Coast being famous from early times. The first British gold coins were made of Guinea gold, hence the name given to the now obsolete "guinea." Gold is still obtained by dredging, and tin is also obtained in the same way from the rivers of Nigeria. But the metalliferous rocks are now being more extensively worked for gold, especially in Ashanti, and for tin in the Bauchi district of Northern Nigeria, these minerals being the most valuable exports of their respective colonies. *Iron ore* is worked by the natives of Northern Nigeria for the making of weapons, implements and utensils.

Manufacturing has been carried on by the Yoruba and Hausa races of the Sudan for centuries. They have worked in iron and brass, woven and dyed

cotton cloth, and manufactured leather and glass, which they have bartered for various forest products with the less intelligent natives of the south, or for dates and European goods brought by Arab traders across the Sahara. Factories for extracting palm oil from the palm kernels, and for preparing cocoa beans for export, have been established at several ports along the coast by European planters.

Transport and Communication. In the forest regions the *rivers* are the easiest highways of trade, although they need periodical clearing of vegetation. The native canoes are supplemented, especially on the Niger, by small Government steamers and motor launches. Apart from the rivers there are well-known *native tracks* through the forest, and, owing to difficulties of travelling and of diseases which make animal transport impossible, much carrying is done by native porters. Kano in Northern Nigeria is the starting-point of *camel caravan routes* to Morocco, Algeria, Tripoli, Egypt and the Sudan, along which loads of ivory, gold dust, leather and spices are carried in return for dates, Manchester goods, flint-locks and other articles of small bulk but of considerable value in the eyes of the natives.

These more or less primitive means of communication are now supplemented by a few good metalled roads and various railway routes. The longest is in Nigeria, and runs from Lagos northward to Jebba on the Niger, and thence to the large native mud-walled city of Kano, a great commercial centre of the Sudan. A branch runs from this line at Zaria to the Bauchi tin mines, and another southward continuing the line of the Lower Niger. A new line is proposed from Bonny[1] on the Niger Delta to the Bauchi district, through a coal-field which has been discovered south of the Benue River.

[1] The railway from Port Harcourt on the Bonny River is now open to the Udi coalfield, 150 miles to the north. The coal, which is of good quality, is thus available for the railways and for shipping.

A line runs from Sekondi on the Gold Coast inland to the gold-mining districts around Kumasi, the old capital of Ashanti, and another is proposed from the same post to connect the other coast towns, Cape Coast Castle, Accra, etc.

In Sierra Leone a light railway runs from Freetown eastward through the length of the colony.

COMMERCE. The trade of those colonies is considerable and increasing, the imports and exports of Southern Nigeria each exceeding an annual value of six million pounds. The more important exports have been noted in previous paragraphs. Most of the *palm oil*, which is the staple export of all these colonies, is exported to Liverpool and used in the soap works of Birkenhead and elsewhere; while considerable quantities are used in the tin-plate works of South Wales, where the Nigerian tin also finds a market. The cotton of Southern Nigeria also goes to Lancashire, and most of the Gold Coast cocoa comes to England. The exports of Sierra Leone go largely to Germany and those of Gambia to France.

In all the colonies the largest import is *cotton goods*, obtained chiefly from Manchester, the clothing of the natives who dress at all being a simple light cotton garment. *Iron goods* and *machinery* are also imported for developing trade and manufactures; and *spirits*, used to purchase the labour of the natives but with disastrous results to their welfare, are imported in large quantities. *Salt*, obtained from the shores of Lake Chad and other salt lakes of the Sahara, is imported into Northern Nigeria, and *coal* is imported into Sierra Leone to supply the fortified coaling-station of Freetown. Various prepared foodstuffs, tobacco and rice are also imported.

Weekly communication is kept up between Liverpool, Freetown and Lagos, and a fortnightly service to Bathurst and other ports. German and French liners also call at the chief ports, and small coasting steamers link up outlying stations. Most of the

trading centres are linked up to the mother country and each other by cable or telegraph, and there are wireless stations at Freetown, Accra and Lagos.

Population. The British West African possessions, which are about four times as large as the United Kingdom, are peopled by about 20 million negroes and a few thousand Europeans. There are many native tribes. Those who live in the forest areas are usually the most degraded, cannibalism and a horrible blood ritual in their idolatrous worship being common. Their clothing, if any, is woven of various vegetable fibres, and they build rude rectangular huts of branches and leaves. Their chief weapon consists of the bow and poisoned arrows, and their food whatever they can catch or collect in the forest. Some of the coastal peoples are fishermen. On the open savanna land to the north, where there has been considerable intermixture with the Hamitic branch of the " white " race, the people are of a somewhat higher type. They keep cattle, practise agriculture and various manufactures, live in communities of circular huts, often enclosed with mud walls, and have considerable tribal organisation. This enabled them to resist to a large extent the slave raiders who harried the more unfortunate tribes to the south, and at times they even preyed on their weaker brethren for the same purpose. They have mainly adopted Mahommedanism from the northern race. Slavery is now abolished in all the areas under British control, and British commissioners now assist the native chiefs in keeping order and administering justice in their districts. Various Christian missions are doing good work in educating the people, and Government schools have been established; but it will be many years before this region can become anything but a tropical dependency, whose welfare and progress are dependent upon the administration of the white man.

CHAPTER XXXIV

BRITISH ISLANDS OFF THE COASTS OF AFRICA

Ascension—St. Helena—Tristan da Cunha—Mauritius—Seychelles—Chagos.

THE economic importance of these islands is small, although they act as cable stations and coaling and victualling stations mainly for tramp steamers. Their usefulness declined with the opening of the Suez Canal; but before that time they were all important links on the Cape Route to India, especially in the days of slower sailing-vessels, when ports of call were desirable at smaller distances from each other than is the case with faster steam and oil-driven vessels.

Ascension is about as large as the Isle of Sheppey, but is volcanic in origin and rises in the centre to a height of nearly 3000 ft. It has a healthy, equable climate, and is used as a sanatorium for British sailors on the unhealthy West African Station. It is famous for its turtles, and grows various fruits and vegetables for its population, which is less than 200 in number. It has cable communication with England via the Cape Verde and Azores Islands, with Cape Town via St. Helena, with Freetown, and with Buenos Aires.

St. Helena is rather larger than Ascension, and its population exceeds 3000. It was once well timbered, but careless lumbering and destruction wrought by goats, which have been introduced and increased largely in numbers, have not only ruined the forests but have exposed the hill slopes to excessive denudation of soil by the heavy rains. Cattle thrive on the island, but there is no outside market for them now that calls from sailing-vessels, homeward bound from the Cape in the track of the South-East Trade Winds, are much less frequent than in olden times. Phor-

mium, or New Zealand flax, has been introduced and flourishes, providing an article of export, and hand-made lace is produced by the women of the island. The island is a coaling-station for warships on the Cape Station, but it is far from prosperous. James Town, on a bay in the north-west sheltered from the prevalent winds, is the chief settlement.

Tristan da Cunha, a small island group in the middle of the South Atlantic, exposed for the greater part of the year to the full violence of the Roaring Forties, supports about 100 people, descendants of shipwrecked seamen, who live by growing root crops, keeping a few sheep and cattle, and fishing. Their only communication with the outside world is by the infrequent and irregular visits of British warships.

Mauritius is an island partly of volcanic and partly of coral formation and surrounded by coral reefs. It is about as large as Worcestershire, and has rather more inhabitants than that county, two-thirds of the total population of nearly 400,000 being Indians. The centre of the island is mountainous, reaching a height of nearly 3000 ft., the coastal plain being widest in the north. Lying in the track of the South-East Trade Winds, it has abundant rainfall. It sometimes experiences violent hurricanes. The tropical temperature and rainfall clothed most of the island with trees, including valuable timber; but, as in St. Helena, the forests have in most parts been carelessly destroyed, with disastrous results. The climate is not particularly healthy, malaria being common. The staple product of the island is the sugar-cane grown in the hot, wet coastal lowlands. African slaves and, later, Indian coolies were introduced by the Dutch, French and British authorities in turn to work on the plantations, and many of the Indians now own their own estates. *Cane-sugar* and *molasses* constitute more than nine-tenths of the total exports, which exceed two and a half million

pounds in annual value. A kind of *hemp fibre* from the native aloe-tree and various *coconut products* are the only other exports of value. The island is almost encircled by a railway, and a line crosses the island from north-west to south-east. The principal imports are cotton goods, cereals and other foodstuffs, artificial manures, hardware and machinery. Most of the trade is with the British Isles and the British colonies around the Indian Ocean; but it still has a considerable trade with France, owing to the development of its resources by the French in the eighteenth century, and the preponderance of French among the present European population.

Port Louis, on a fine, sheltered harbour in the north-west, is the capital, the chief commercial centre, and a fortified coaling-station. It is connected by cable to Zanzibar via the Seychelles, to Madagascar, to Durban and to Australia via Cocos, Batavia and Port Darwin.

The Seychelles are a group of volcanic islands surrounded by coral reefs. Mahé, the largest island, is about as large as Jersey. The climate is hot throughout the year, and there is sufficient rainfall, so that tropical plants of all kinds flourish. The most characteristic and most useful is the coconut palm, which furnishes *copra* and *coconut oil*, the staple exports of the island. There are now promising plantations of Para *rubber*, and *vanilla* and *cinnamon* are other products of the islands. *Guano* is also collected and exported. Fishing is an important local industry. The coco-de-mer, a double coconut which derived its name from the fact that the nuts were often washed ashore in the Maldive Islands during the South-West Monsoon and were there discovered by sailors, is the fruit of a tree peculiar to several of the islands of this group. The population numbers about 26,000, mostly negroes, with a few Europeans, chiefly French. German and French liners in the East African services call regularly at the capital, Port Victoria, which has

a fine harbour, and the British India Line calls on the route between Mombasa and Bombay.

The Chagos Archipelago is a group of coral islands on the route from Aden to Perth. Coconuts, oil and copra are their only commercial products. Diego Garcia, on an atoll whose lagoon makes a fine harbour, is a coaling-station.

PART V

AMERICAN POSSESSIONS

CHAPTER XXXV

THE DOMINION OF CANADA

Extent—Physical Features—Development—Climate.

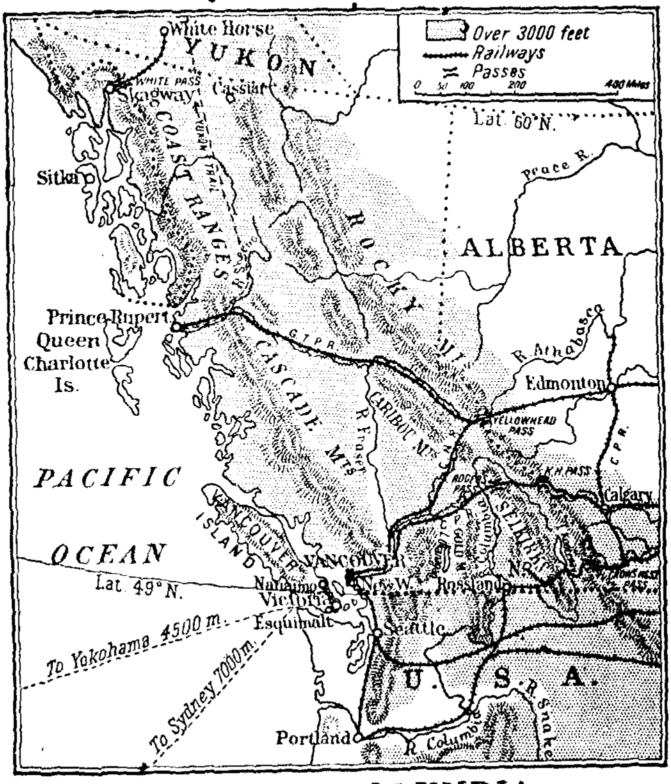
THE Dominion of Canada, the largest of our self-governing colonies, extends for some 3000 miles between the Atlantic and Pacific Oceans and about 1500 miles southward from the shores of the Arctic Ocean. It covers an area thirty times that of the British Isles, and occupies practically the northern half of North America, with the exception of the United States territory of Alaska in the extreme north-west. Newfoundland is not part of the Dominion, but is a separate self-governing colony. The Dominion has been acquired by colonisation, conquest, purchase, and federation of its several provinces between the seventeenth and nineteenth centuries.

PHYSICAL FEATURES

Physically Canada falls naturally into three fairly well-marked natural regions: (1) the Western Mountain Ranges, covering the provinces of British Columbia and Yukon; (2) the Central Plains, divided into the prairie provinces of Alberta, Saskatchewan, Manitoba and the North-West Territory; and (3) the Eastern Highlands, occupied by Ontario, Quebec and the Maritime Provinces.

1. *The Western Mountain Ranges.* These consist

of a number of roughly parallel ridges and valleys running from north to south, and covering the country to the width of between 500 and 800 miles



BRITISH COLUMBIA
FIG. 34.

inland from the Pacific coast. They have been formed by the folding of the earth's crust, and as this folding brings to the surface many different rock layers, which are further exposed by the

denuding action of rain and frost, they are rich in mineral wealth, which is fairly easily worked. The seaward slopes, especially of the ridges that lie nearest to the coast, receive abundant rainfall from the Pacific, and are clothed with magnificent forests. The sheltered "intermont" valleys, though often lacking in rainfall, can be irrigated from the rivers which draw their water from the heavy rainfall and melting snows of the higher ridges, and are very fertile. Owing to the steep drop to the Pacific coast these rivers are of little value for navigation except for a few miles at their estuaries, but the Fraser, Skeena and Stikine rivers abound in salmon, which ascend from the sea in enormous shoals at certain seasons.

The coast is deeply indented by almost innumerable *fiords*, similar to those of Norway, Southern Chile and South-West New Zealand. These fiords are long, narrow, winding, steep-sided and deep-watered inlets due to the submergence of valleys which have been scooped out by ancient glaciers descending to the sea from the ice-fields among the mountain summits. They are no less famous for their scenic beauty than for their utility as harbours, especially where, as so often happens, they are further sheltered by a fringe of islands lying off the coast, and marking the line of another ridge of the parallel mountain system whose valleys have also been submerged in relatively recent times. Vancouver and Prince Rupert have grown up on two of these fiords.

Communication along the north and south running valleys is comparatively easy, and the long, deep, narrow lakes that fill portions of them are as useful as they are picturesque. But the mountain ridges, which rise to a height of two or three miles above sea-level, are a great obstacle to communication between the Pacific seaboard and Eastern Canada. The natural passes across them, therefore, assume an enormous importance. The Canadian Pacific Railway

main line crosses the Rocky Mountains by the Kicking Horse Pass just a mile above sea-level, the Selkirk Range by the Roger's Pass at a height of 4500 ft., and the Gold Range at a height of 2000 ft. In each case there is a laborious ascent to the pass and a steep and difficult descent to the valley on the other side. A branch of the same railway crosses the Rockies further south by the Crow's Nest Pass at a height of 4400 ft., that is, as high as the summit of Ben Nevis, and the Grand Trunk Railway crosses the same ridge by the Yellowhead Pass at a height of 3700 ft.

2. *The Central Plains* extend from the foot of the Rocky Mountains to the shores of the Great Lakes, Hudson Bay and the Arctic Ocean, to which they descend in three more or less well-marked steps. The highest lies between 2000 and 3000 ft. above sea-level, and is, therefore, more truly a plateau. Its surface is undulating and covered with a fine, rich soil, but, lying close under the lee of the Rockies, suffers from a scanty rainfall, especially in the south. It is, therefore, covered with grass suitable for cattle and horse ranching, but has no trees and is only cultivated where water for irrigation can be obtained from rivers.

The two lower steps, corresponding roughly with the provinces of Saskatchewan and Manitoba in the south, are known as the *prairies*, and their vast level expanses, their fertile soil and sufficient rainfall have made them one of the world's greatest granaries. Further to the north, the movement of the great ice-sheet, which in the remote Ice Age covered all this portion of the earth's surface, scraped the rocks bare of soil and left in many places great hollows, since filled with water, and forming the great chain of lakes that stretch from Lake Superior to the mouth of the Mackenzie River.

The plains are crossed by a number of large rivers rising in the Rocky Mountains and draining these

lakes to the Arctic Ocean and Hudson Bay; and although some of them, notably the Saskatchewan, afford easy means of internal communication in the summer months, they are not of great value, for their courses are impeded by rapids, and they flow to seas closed by ice for many months of the year.

3. *The Eastern Highlands* consist of the Laurentian Plateau and the northern portion of the Appalachian Highlands, separated by the Great Lakes and the River St. Lawrence, which drains them. In this region, also, ice action has left its mark in soil-scraped rocks, many lakes, and fiords on the coast. Most of the region is still thickly forested, and it is only along the shores of lakes, rivers and sea that a sufficiency of soil has encouraged the clearance of the forests for the opening up of agriculture. The descent of rivers from the plateau gives rise to considerable water-power, which is extensively used in Canadian industry. The highland regions contain many valuable minerals, notably coal and copper.

The coast has many good harbours, including those of Halifax and St. John, which are open all the year round; and the St. Lawrence and the Great Lakes form the great natural highway into the country for the greater part of the year. The shallow seas off the coast of Nova Scotia, part of the famous Banks of Newfoundland, abound in fish.

Development

Till the end of the sixteenth century the forests and prairies of Canada were the hunting-grounds of various tribes of Red Indians. The severe winters and fogs of the St. Lawrence estuary deterred European settlers, and Hudson and others had perished in unsuccessful attempts to find a "North-West Passage" to the Pacific by way of the island groups and frozen seas that lay to the north of the continent. Hardy British and Breton fishermen later

founded settlements on Newfoundland and the neighbouring coasts, and French colonists eventually commenced to clear the forests and make agricultural settlements around the St. Lawrence estuary. A suggestion to link up these northern colonies with the French settlements in the lower Mississippi Basin, by a line of forts to the west of the Appalachian Highlands, seemed to threaten the future expansion of the British New England States which had been established along the Atlantic seaboard, and eventually led to the Seven Years' War, as a result of which the French lost all their possessions in North America. Place-names, such as Quebec and Montreal, and the large French-speaking population of the province of Quebec, serve as reminders of this period; but, as Canadians, both races now share the same privileges and interests.

Meanwhile, the Hudson Bay Company, founded in 1670, had established fortified trading-stations along the shores of the Bay and of some of the rivers of the interior, to purchase furs from the Indian trappers for export to Europe. The Company obtained a strong political hold over Central Canada, and the Government purchased their claims in 1869, thus adding the prairie provinces to the Dominion, which had been constituted two years earlier. Far-off British Columbia, occupied in 1858 by the "overflow" of the gold rush to California, remained isolated from the Dominion by the mountain wall of the Rockies, and only agreed to join on the understanding that it should be linked up with Eastern Canada by a railway. This stimulated the construction of the Canadian Pacific Railway, the brilliant venture initiated by the late Lord Strathcona and successfully completed in 1885, leading to the rapid commercial development of what till that time was known as "The Great Lone Land" of North-West Canada.

Climate

For many years Canada was commonly regarded in England as a great frozen waste, a delusion that was partly fostered by interested fur-traders who had no wish to see their preserves invaded by an influx of immigrants.

But we now know that, although over the greater part of the country the winters are much more severe than in this country, the coastal regions of British Columbia have a climate almost identical with that of the British Isles, and the summers of the parts of the Dominion in similar latitudes are much hotter than our own. The area of the country is, however, so great that there are considerable differences of climate between one region and another.

Temperature. A study of the course of the January isotherm of 32° F. is instructive. All places to the north of this line have a mean temperature below the freezing-point for a month or more in the winter, with the result that all rivers and lakes are frozen over and any moisture that falls is precipitated in the form of snow. It will be seen that this is true of the whole of Canada except the coastal region of British Columbia. Navigation is suspended on the Great Lakes from November to April, and in some years even the Niagara Falls become frozen. The *severity of the winter* is due to three causes—

1. *The great distance of most of the interior from the moderating influence of the open ocean,* which is able to retain the heat received from the sun during the summer months much longer than the land.

2. *The absence of a sheltering mountain range to keep off cold northerly winds from the Arctic Ocean.*

3. *The general slope of the interior of the country from south to north,* that is, away from the sun.

The mildness of the west coast is due to—

1. The prevalent south-westerly winds coming from the relatively warm Pacific Ocean; and—

2. The warm surface drift-water of the Kuro Siwo, or Japanese Current, brought across to the Canadian shores by the same winds, and comparable with the Gulf Stream Drift in the North Atlantic Ocean.

3. The shelter of the Rocky Mountains from cold winds from the north and the frozen interior in winter.

The *east coast is colder* because—

1. The prevalent winds blow off the frozen continent, and

2. The shores are washed by the cold Labrador Current which flows down from Davis Strait, freezing up the relatively fresh waters of the Gulf of St. Lawrence, thereby adding to the commercial importance of Halifax and St. John, which remain open, while their rivals, Montreal and Quebec, are ice-blocked.

Although the winter is so severe, the temperature often falling twenty or thirty degrees below freezing-point, it is not unpleasant, as the weather is also usually dry and bright, and the industrious inhabitants can usually afford time for the enjoyment of the many winter sports that are made possible by the frozen rivers and lakes and snow-covered hillsides. The thick layer of snow also protects the autumn-sown wheat which is a feature of the eastern provinces, and allows the harvest to be gathered in earlier and exported well before the freezing of the lakes. Even in the west, where there is less snow and wheat is sown in the spring, the winter frosts serve to destroy insect pests and to break up the soil.

The severe winters also serve to deter indolent or otherwise undesirable immigrants, especially from the warmer countries of Southern Europe and from across the Pacific Ocean, while not affecting the influx of hardier and more industrious workers from the countries of Northern Europe. Canada is thus saved from some of the problems which face the United States and Australia.

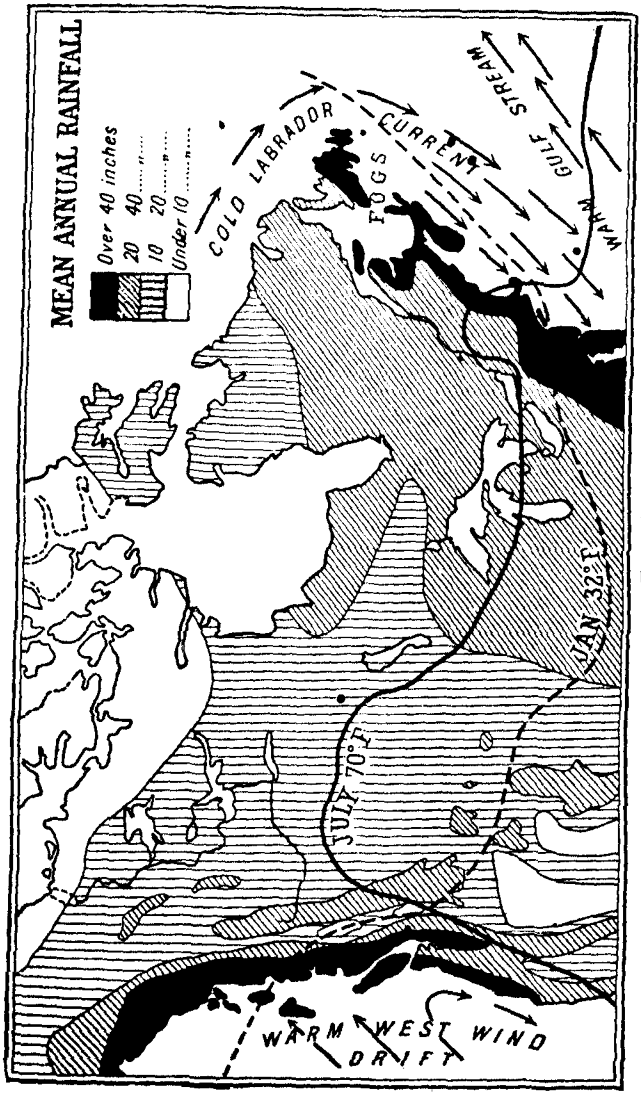
An examination of the *July isotherms* shows that

no part of Canada is frozen up in summer, and that the greater part of the Dominion has higher average temperatures than the British Isles at the same season. It will also be noticed that the winter conditions for the west coast are now reversed, and the influence of the oceanic winds is to make it cooler than the interior. Thus while the range of temperature between the hottest and coldest months at Winnipeg is 61° F., at Vancouver it is only 27° F. The high summer temperatures on the prairies are excellent for ripening the grain, and in the "Lake Peninsula" between Lakes Huron and Ontario grapes, apricots and other fruits ripen outdoors.

Rainfall. Fig. 35 shows that the deposition of moisture in Canada is largely dependent upon physical features, the higher regions, especially near the coast, receiving much heavier rain and snowfall than the lower interior. It should be noted that "one inch of rainfall" would be sufficient to cover the ground to the depth of almost a foot if it fell as snow.

There are few parts of Canada where the rainfall is insufficient for the growth of crops. The largest area lies along the shores of the Arctic Ocean, but here, owing to the slight evaporation and to the low temperatures unfavourable to plant life, the scanty precipitation is unimportant. In winter the region is a frozen waste, and in summer largely a swamp with drier patches covered with reindeer moss and supporting a stunted tundra vegetation. A few thousand Eskimos manage to exist by fishing and hunting the polar bear and such fur-bearing animals as the caribou and musk-ox, which come northward in the summer months.

Other insufficiently watered areas are the isolated valleys among the higher western mountain ranges and the plains at the eastern foot of the Rocky Mountains, which deprive the wet westerly winds from the Pacific of nearly all their moisture. But the rivers draining the mountains and flowing across



MEAN ANNUAL RAINFALL
Over 40 inches
20 40
10 20
Under 10
COLD LABRADOR CURRENT
FOGS
WARM GULF STREAM
JULY 70° F.
JAN. 32° F.
WARM WEST WIND DRIFT

FIG. 35.

these valleys and plains can be utilised for irrigation if desired. The scanty rainfall, too, is quite sufficient for the growth of good grass, which, before the advent of European settlers, afforded pastures to herds of bison. These have now given way to the cattle, horses and sheep of the ranchers, as the Red Indian hunter has been superseded by the "cowboy." These dry plains, too, have the advantage of never being thickly covered with snow in winter, so that cattle remain outside all the year through. Any snow that falls is quickly melted by the warm, dry "chinook" wind, which, like the "foehn" of Switzerland, comes over the mountains, having deposited its moisture in its ascent to the summits, and becoming warmed by compression in its descent to the plains.

The wettest part of the Dominion is the coastal region of British Columbia, where the moisture-laden winds from the Pacific Ocean meet the high western mountain ridges, in some parts depositing as much as 100 inches a year. The higher mountains are always snow-capped, the snow-line being at a height of about 8000 ft. in Southern Canada. Among the Selkirks there are some fine glaciers. The higher levels of the railways are sometimes blocked with snow in winter, and some sections need protection from avalanches. The heavy rainfall and mild temperature of the lower mountain slopes both on Vancouver Island and the mainland encourage the growth of magnificent trees, including the gigantic Douglas Pine.

The region between the Great Lakes and the Atlantic gets plenty of rain in the warmer months and very heavy falls of snow in the winter, which often cause serious hindrances to communication and make the snow-plough a necessity on the railways. The abundant rainfall has made the whole region thickly forested, and although the trees are not so fine as in the milder west, this is the great lumbering region.

The prairie regions of Saskatchewan and Manitoba, while much drier than either of the coastal regions, get between fifteen and twenty inches of rain per annum, chiefly falling in the warmer months, when rain-bearing winds are drawn farther into the continent. This is ample for the growth of cereals, which is also being extended into the drier regions of the west and colder regions of the north as newer and hardier varieties of grain are being scientifically produced.

With the exception of the frozen north, appropriately known as the Barren Lands, the climate of Canada is healthy and stimulating, and such as will assist the highest possible economic development. It allows of the growth of all the necessities of life, but demands that the people shall work hard through the summer months in order to provide themselves with means to withstand the rigours and enjoy the delights of a hard winter, when most outdoor work is at a standstill.

CHAPTER XXXVI

THE DOMINION OF CANADA (*continued*)

INDUSTRIES AND PRODUCTIONS

Forestry—The Hudson Bay Company—Lumbering—Fishing—Pastoral Industries—Agriculture.

Forestry. For many years Canada was regarded by Englishmen as a purely forest country, and it is not long since emigrants to the Dominion were referred to by their friends at home as "backwoodsmen."

Even now it is officially estimated that some 400 million acres of the country are covered with forests, whose products, including timber, furs from the animals, resin, wood pulp, bark used in tanning, and

even sugar from the maple, are some of the most valuable natural resources of the country.

These forests extend across the country from south-east to north-west in a broad belt some 500 miles in width, spreading out at each end so as to cover completely the area between the Great Lakes and the Atlantic on the east, and between the Rocky Mountains and the Pacific on the west. The former area contains about a half and the latter a quarter of the total forests of the country. In the interior the forest belt is limited by cold in the north and scanty rainfall in the south.

The Hudson Bay Company, which did so much to make known the country to the outside world at the end of the seventeenth century, opened up "factories," or "forts," along the shores of the bay. These were rough log cabins, to which the native hunters, who glided over the forest lakes and streams in the summer in their birch-bark canoes and over the snow-covered forest trails on their snow-shoes in the winter, brought the spoils of the chase, bartering them with the "factors" of the Company for blankets, firearms, food, spirits, trinkets and tobacco. The operations of the Company were extended further inland into the "Great North-West" each year, and new forts were established along the rivers of the interior. The modern cities of Winnipeg and Edmonton mark the sites of two of these early establishments, and these and many other towns on the Canadian Pacific Railway are still collecting-centres of the Company. And still, in the few short months when the bay is free from ice, ships call at York Factory and Port Churchill to bring the *furs of the musk-rat* and *marten*, *lynx* and *fox*, *mink* and *sable*, *beaver* and *otter*, from the wild and silent Canadian forests to minister to the comfort of the women of Northern Europe, where the forests and their animals have disappeared before the advance of modern civilisation.

In recent years, however, the value of the *timber* hewn from the forests has far exceeded the value of the furs obtained from the animals. The early pioneers had to clear the forest before they could begin to cultivate the ground, and the wood-fenced fields and clumps of trees, so characteristic of the farms in Eastern Canada, are still landmarks of this period. In those days timber was an obstacle to be destroyed, but now with the demands of the farmers of the treeless prairie for his farm buildings, and of the forest-denuded countries of Europe for timber for building, for telegraph posts and for pit-props, the " lumber " of Canada is a most valuable asset.

The greatest *lumbering regions* are the coastal districts of east and west, for here the timber is finer and larger on account of the heavier falls of rain and snow, and also there are greater facilities for exporting the logs. The timber exported in largest quantity is obtained from various species of fir and pine, the Douglas Pine, which flourishes on the coastal ranges and islands of British Columbia, being one of the most magnificent trees in the world, specimens often attaining a height of over 300 ft. Spruce, birch, cedar, hemlock and tamarack are also valuable for timber. The warmer southern edges of the forest produce broad-leaved, deciduous trees, such as oaks, maples and poplars, which are also useful, the beautiful spotted wood of the " bird's-eye " or sugar-maple being very ornamental.

Lumbering is an important industry in Nova Scotia and New Brunswick, but the chief lumbering region is along and between the Ottawa and Saguenay tributaries of the St. Lawrence. There is the greatest activity in the lumber camps in winter, when the felled trees can be easily drawn over the hard, frozen, snow-covered ground to the banks of the frozen river, where the logs are lashed into huge rafts. When the ice breaks up in spring the rafts are floated down stream to the saw-mills, which are mainly driven by

water-power, and are, therefore, inactive in the winter. This is convenient where labour is scarce, for the same man can work in both saw-mill and lumber camp each in the appropriate seasons. The city of Ottawa, situated where the river leaps over the Chaudière Falls, has the largest saw-mills in the country. The sawn timber is again made into rafts and floated down to the St. Lawrence, where it can be exported either from Montreal or Quebec.

The Douglas Pines and cedars of British Columbia are chiefly sawn up and exported from Vancouver, Victoria and New Westminster.

The timber hewn from the Canadian forests in 1912 was valued at about 16 million pounds, half of it being exported. The Forestry Department of the Government take great precautions to guard against the destruction of the forests by careless lumbering and forest fires, and new trees are planted every year to replace those that are cut down.

Fishing. The five thousand Eskimos who live along the Arctic shores are still primitive fishermen, almost entirely dependent upon the sea for their means of existence. Their chief food is fish and seal meat; their clothes are seal skin; their summer tents and kayaks, or canoes, are made of driftwood covered with skins; and blubber, the fat from seals and whales, is their only source of light and warmth in the long, cold, dark winter night, when the sun never rises above the horizon for weeks together.

But the sea and river fisheries of Southern Canada are very important as a source of food supply and as providing a valuable article for export. In 1912 the total catch was worth seven million pounds, nearly half of which was exported. The *salmon fisheries* of British Columbia are the most valuable, the fish being caught in the fiords and river estuaries, particularly the Fraser and the Skeena. Every spring enormous shoals ascend these rivers from the sea, and are most easily caught. Large quantities are tinned in the canning

factories of New Westminster and Prince Rupert, which employ in the summer months thousands of Indians, Chinese and Japanese, with a few white overseers. Fine *halibut* are caught off Queen Charlotte Islands, and *cod* and *herring* abound. From Victoria whaling and sealing fleets go out to the fisheries on the shores and islands of the Behring Sea, where the Pribilof Islands are famous for their *fur seals.*

The *cod, halibut, mackerel* and "*sardine*" *fisheries* of Nova Scotia, New Brunswick and Prince Edward Island are next in point of value, the fish being very abundant in the cool, shallow waters that surround these provinces. These fishing-grounds are comparable with the Grand Banks off Newfoundland and the Dogger Bank of the North Sea. *Lobsters* are caught round the inshore rocks. The lobsters are canned for export, and the cod is salted and dried and sent to the Roman Catholic countries of Southern Europe, the West Indies and South America.

The Great Lakes and rivers of the interior abound in fish, providing food for the people and sport for anglers.

The actual fisheries employ nearly 100,000 men.

Pastoral Industries. Between the Great Lakes and the Rocky Mountains and south of the Forest Belt lies the comparatively flat and treeless prairie. The drier western portions lying under the "rain-shadow" of the western mountains were soon discovered to offer facilities for cattle-rearing on a large scale, and till the recent introduction of irrigation, ranching was almost the only industry of Alberta. Large herds, tended by cowboys on horseback, are still kept in this and the neighbouring province of Saskatchewan, Calgary and Regina being great cattle markets.

Abundance of nutritive grass covers the plains in spring and early summer, and is dried into hay as it stands, by the heat of late summer and autumn. Owing to the chinook winds (see p. 248) this never becomes thickly covered with snow in the winter, so that the

cattle remain out in the open all the year round. This dispenses with the need for building sheds or the growing of root crops for winter food. The cattle are sent to the richer pastures along the rivers for fattening, and are then despatched eastward by rail to the large towns of Eastern Canada for export to Europe.

Horses are also reared in large numbers in Ontario, Saskatchewan and Alberta, for use on the farms and also for export.

Ontario, Quebec and the Maritime Provinces now rear large numbers of cattle, mainly for dairy produce, cheese and butter being very important exports. The herds are smaller, being kept in fenced fields during the summer, and in sheds from November till April, when the ground is always thickly covered with snow. The pastures in this region are in the forest clearings, and owing to the greater rainfall are much richer than on the western prairie, the conditions under which the dairy-farming is carried on in the east being very similar to those prevailing in the mother country. On the rich shore lands of the Bay of Fundy cattle are fattened for export.

Large numbers of pigs are kept, especially in Ontario, giving rise to the curing and export of bacon in large quantities.

At present there are comparatively few sheep in the Dominion, most being kept in Ontario and Quebec, where they provide wool for the mills that have been established in those provinces.

Agriculture. This is the most important industry of the Dominion, and produces about 40 per cent. of the total exports of the country.

Wheat is by far the most important crop, occupying in 1913 11,000,000 acres, or nearly a third of the cultivated area of the country. The first settlers grew their wheat in the forest clearings of the east, but when the great treeless prairies of the interior were discovered, the centre of the wheat-growing industry moved rapidly westward, and the farmers of

the east, while still growing wheat for home consumption, now find it impossible to compete with those of the prairie provinces in the matter of export, and are turning their attention to other branches of the industry, notably dairy-farming and fruit-growing.

Saskatchewan now has almost six million acres under wheat, Manitoba nearly three million, and Alberta one and a half million acres. The factors that favour wheat production in these provinces may be summed up as follows—

1. The land being treeless is immediately ready for the plough, without the trouble of preliminary clearing.
2. The rich, black, loamy soil is exceedingly fertile. This is especially so in the Red River District south of Lake Winnipeg, which district is the floor of an old lake covered with alluvial soil brought down by its tributary streams.
3. The climate is very suitable, for the winter cold cleanses and pulverises the soil, and the intense heat and bright sunshine of summer ripen off the grain to perfection.
4. The levelness of the ground facilitates ploughing, sowing and reaping, and allows of the use of large labour-saving machinery, which is very important where manual labour is scarce. It has also aided the construction of railways, upon which the industry is largely dependent, for it is useless to grow large crops of wheat unless they can easily be transported to the markets.

In the eastern provinces, and in those parts of the prairie where a heavy snowfall can be relied upon, "fall" wheat, that is wheat planted at the end of autumn, is grown. The heavy snow protects the young shoots from damage by winter frosts. But over most of the prairie "spring wheat" is most common, the ploughing and sowing being carried out in April after the disappearance of the snow. The advantages of the "fall" wheat are that it produces heavier crops (*e. g.* in Ontario in 1913, 25 bushels per

acre as against 18 bushels from the spring wheat, and in Alberta the proportion was 20 to 18 in the same year), and it allows of an earlier harvest. This is important, owing to the freezing of the waterways, which closes the cheaper lake and canal routes at the end of October. Autumn frosts are also detrimental to the quality of the grain. Indeed, owing to the absence of a natural barrier against icy winds from the Arctic, destructive night frosts sometimes occur in late summer.

When the grain is reaped it is immediately threshed and transported to the nearest "elevator." One or more of these storage centres is situated at most of the stations along the railways across the prairies, and there are many along the shores of the Great Lakes, notably at Port Arthur and Fort William. The Elevator Companies purchase the wheat from the farmer, or, for a consideration, hold it in trust for him and advance money upon it till market and transport prices are most favourable, acting, indeed, as a sort of bank.

Oats, too, are largely grown, the acreage devoted to this crop being almost as large as in the case of wheat, and the production in bushels almost twice as great. The crop is grown in the cooler parts of the wheat-belt and very extensively in the moister eastern provinces, Ontario having almost three million acres under oats. The crop is largely grown for feeding horses and as winter food for cattle, and large quantities are sent across the lakes to the United States for similar purposes.

Barley is the only other cereal extensively grown in Canada, and is much less important than either wheat or oats.

With the increase of population and means of transport the growth of these cereals is being extended each year into the cooler lands of the north and drier lands of the west. Profitable crops of wheat have been grown as far north as Fort Vermilion on the

Peace River and Fort Simpson on the Mackenzie, where the long summer days, owing to the high latitude, are very important in allowing the grain to ripen. In the dry lands of Alberta the Canadian Pacific Railway Company have constructed large irrigation works in the neighbourhood of Calgary and Lethbridge, utilising the water of the Bow and St. Mary's rivers, and American farmers from some of the drier States across the border have introduced careful methods of preparing the soil so as to economise the scanty rainfall. The study of scientific methods of farming and the production of grain adapted to peculiar conditions of temperature and rainfall, is occupying much attention in the Agricultural Colleges, which are a feature of the Dominion.

Maize can only be ripened in the hot, moist summer of the southern corner of the Lake Peninsula of Ontario. As in the United States, the crop is chiefly used for feeding pigs.

Potatoes and other Root Crops are largely grown as food for man and beast in the eastern provinces, where also enormous areas are devoted to the production of hay and clover as winter food for the cattle, which have to be housed from November to April.

Sugar Beet is now being largely cultivated in Ontario and Alberta, and the production of sugar is encouraged by bounties from the Provincial Governments. The fact that the principal sugar factory in Ontario is at a place called Berlin is indicative of the origin of the industry. Raymond, in South Alberta, has also a large factory.

Fruit-growing is becoming increasingly important, especially in the Lake Peninsula of Ontario, where one of the counties of the province is appropriately called Kent. Being in the latitude of the South of France, *peaches* and *grapes* there ripen outdoors in the hot summers, and in other parts of the province *all the well-known English fruits* flourish. The trees must be sufficiently hardy to withstand the cold

winters, which, however, are beneficial in destroying insect pests.

In the Annapolis Valley and Minas Basin of Nova Scotia, along the shores of the Bay of Fundy in New Brunswick, and in Prince Edward Island fine *apples* are largely grown for export, and other hardy fruit flourishes.

In the sheltered "intermont" valleys of British Columbia, between the line of the Canadian Pacific Railway and the southern boundary, fruit "ranching" under irrigation is being developed on a large scale. *Plums*, *pears* and *peaches* come to perfection, and are tinned for export. The valleys of the Fraser and Columbia rivers and the neighbourhood of Lake Okanagan are particularly famous, and New Westminster has added fruit-canning to its already well-established salmon-packing industry.

Flax is cultivated on more than a million acres in Saskatchewan.

Tobacco is also successfully grown in Southern Ontario.

Work on the farms is at a standstill during the winter, and casual labourers then find employment in building, in railway construction, or in the lumber camps. A few may go trapping in the forests.

CHAPTER XXXVII

THE DOMINION OF CANADA (*continued*)

INDUSTRIES AND PRODUCTIONS (*contd.*)

Mining and Manufactures.

Mining. Owing to the variety of the rock structure of the Dominion, the produce of the mines ranks next to that of the fields in order of value of the natural products of the country. In 1913 some 30 million

pounds' worth of minerals were raised, over a third of that total being exported.

Coal accounted for a quarter of the total production. Half the coal raised comes from Nova Scotia, the largest mines being around Sydney on Cape Breton Island, and the northern shore of the mainland along the Intercolonial Railway. Some of the seams are worked under the sea. Coal is exported from Sydney to the towns along the St. Lawrence estuary, to the nearer ports of the United States, and to Newfoundland; rich iron ore being brought back from the last-named to be smelted at Sydney and Glasgow, where large ironworks have been established.

The coal mines of British Columbia are next in importance. The largest are on Vancouver Island near Nanaimo and Ladysmith, some seventy miles north of Victoria along the east coast. Others are at Fernie at the eastern approach to the Crow's Nest Pass, and in the Kootenay District. Valuable deposits of anthracite have been discovered on the east coast of the Queen Charlotte Islands opposite to Prince Rupert, the terminus of the Grand Trunk Pacific Railway.

In Alberta there is a small mine of anthracite near to Banff at the foot of the Kicking Horse Pass; but around Edmonton and extending into Saskatchewan are vast deposits of poorer lignite coal, which is, however, of immense value for fuel in a treeless country.

There is still a large importation of coal into Canada from the United States, especially to feed the manufacturing industries of Southern Ontario, where coal is more cheaply brought across the Lakes than it could be transported from the Canadian coal-fields, even were their production sufficient.

Silver is the next mineral in point of value. Nine-tenths of the total production comes from Cobalt in Ontario, 100 miles north of the Canadian Pacific main line, with which it is connected, and close to the

boundary of Quebec. Smaller quantities are obtained near Nelson and Rossland in British Columbia.

Gold is fairly widely distributed among the older rocks of east and west. The yield in Nova Scotia and along the shores of Lake Superior in Ontario is small, and the largest quantities come from several "fields" in British Columbia and the Klondike district of the Yukon territory. Veins of gold occur in hard crystalline quartz rock. Sometimes the rock has been broken up by the action of frost, rain and running water, and the gold is then found in nuggets or fine grains mixed with sand in the beds of streams or rivers, or in old river-beds. This method of obtaining gold is known as "placer" mining, the essential feature being a good supply of water for separating the gold by washing. This method is chiefly in use in the Yukon, and hydraulic machinery and dredges are used to aid the miners. The hard frosts of the long winter are a great obstacle to the work, and in some parts steam is used to thaw the ground.

When the placer deposits are worked out, the gold-bearing quartz rock is usually blasted out with dynamite and then crushed by machinery, the precious metal then being separated by washing with water, or by a process involving the use of mercury. This method, which is known as "lode" mining, is chiefly used in British Columbia, the chief mining centres being Rossland and Nelson. There are also placer workings in the Cariboo and Cassiar districts further north. Gold-mining is now no occupation for fortune-hunters, but needs skilled workers and elaborate machinery.

Nickel is the next mineral in point of value. It is not only used in electroplating and for the making of coinage, but mixed with steel it adds greater toughness, hardness and ductility to the metal, so that nickel-steel is used in making armour plates. Sudbury, on the Canadian Pacific Railway in Ontario, has the most valuable nickel deposits in the world.

Copper is found in largest quantities in the Sudbury district of Ontario and the Rossland district of British Columbia. Smaller quantities are worked in Quebec and the Yukon territory.

Iron ore is widely distributed, but is only worked to any great extent in the Michipicoten district on the northern shore of Lake Superior. It is smelted at Sault Ste. Marie and Hamilton, largely for use in railway work. Fifteen times as much pig-iron is smelted from ore imported from the United States and Newfoundland as from home-produced ore.

Other minerals mined or quarried in considerable quantities include *clays* used in making bricks and cement, and *granite, limestone* and *sandstone* for building purposes, found in all the provinces; *asbestos,* famous for its fireproof and heat-resisting qualities, obtained in Quebec on the south side of the St. Lawrence; *petroleum* and *natural gas,* obtained from springs and natural reservoirs in South-West Ontario near Petrolia and around Edmonton in Alberta.

Manufactures. The conditions for the establishment of a successful manufacturing industry are—

1. Abundance of raw material easily procurable.
2. Abundance of power for driving machinery.
3. A large supply of manual labour.
4. Good markets for the finished products.
5. Facilities for gathering together the raw materials and distributing the manufactured goods by road, river, railway and canal.

Now, previous paragraphs have shown that Canada has abundance of practically every raw material that could be desired, except such tropical and subtropical products as rubber and cotton. It has also been shown that she is not lacking in power, for she has fine coal deposits, which can be cheaply supplemented by imports across the Great Lakes; there are supplies of oil fuel and natural gas in several places (the latter costing only 2½*d.* per 1000 cubic ft. at Medicine Hat), and her lakes and rivers, especially in the highland

regions of east and west, are large and unfailing sources of water-power. Her magnificent navigable waterways have been supplemented by a very fine railway system, so that all the provinces have easy means of communication with each other. But she has only a home population as large as greater London to draw upon for workers and to serve as a market for manufactured goods, and consequently the proportion of the population engaged in manufacturing industries is still even less than it is in Ireland. However, the number of factories and workers in them is increasing steadily year by year, especially in the more thickly peopled eastern provinces, Ontario accounting for about half and Quebec a third of the total engaged.

Cheese and Butter factories are attached to the dairy farms of Ontario, which is the greatest exporter of cheese in the world.

Flour mills are important at Winnipeg and Montreal, both great collecting-centres for wheat, the comparatively dry climate of the former favouring the industry.

Saw mills have been established wherever there is a waterfall on the rivers of the lumbering country, especially at Ottawa and Vancouver, and in Nova Scotia and New Brunswick.

Pulp mills and *Paper mills* for the utilisation of smaller trees have been established near the saw-mills. Most newspapers are printed on paper made from the pulp into which the timber is torn and ground in these mills; but finer paper, and even a silken material, is made from wood pulp obtained by a chemical treatment which softens without destroying the fibre.

The making of furniture and of *barrels* for exporting fruit are also important branches of the timber trade. At one time Nova Scotia had a considerable industry in wooden shipbuilding.

Leather tanneries are important at Quebec and Fredericton, local cattle providing hides, the forests

giving the bark of the hemlock spruce for use in tanning, and the falls of the Montmorency and St. John rivers respectively supplying power. Quebec has a large boot and saddlery industry.

Iron smelting is carried on at Sydney in Cape Breton Island with local coal and limestone and ore imported from Newfoundland, at Sault Ste. Marie and Hamilton with ore from the shores of Lake Superior and coal from the United States. At Hamilton, Kingston and Montreal there is considerable industry in the making of *machinery, locomotives* and rolling stock for railways, and *agricultural implements.* Vancouver and New Westminster are also developing similar industries, and the last-named has *iron shipbuilding* yards, utilising the coal and iron of Vancouver Island.

Sugar refining is an important industry at Montreal, where the raw material is obtained from the sap of maple-trees grown locally and from imported cane-sugar from the West Indies. Sugar is refined from locally grown sugar-beet at Berlin in South Ontario and Raymond in South Alberta, and from imported cane-sugar, grown on the Southern Pacific coasts and islands, at Vancouver.

Petroleum refineries are situated at London and Sarnia in South Ontario.

Textile factories, using home-produced wool and cotton from the Southern States, are situated at Montreal and Quebec, where water-power is cheap, the climate is sufficiently damp, and the population fairly dense. There are also factories at smaller towns on the south side of the St. Lawrence and in the larger lake towns of Ontario.

Fruit and *salmon canning* are important industries of New Westminster and other towns of British Columbia.

CHAPTER XXXVIII

THE DOMINION OF CANADA (*continued*)

COMMUNICATIONS AND COMMERCE

The Great Lake Routes—Canadian Pacific Railway and other Railways—Commerce and Seaports.

In a country so large and so richly endowed with natural resources as Canada, means of transporting the productions of one region to exchange for those of another are of the greatest importance, and this importance is only increased by the fact that much of the economic activity of the country is concerned in producing a large surplus of foodstuffs and raw materials to exchange for the manufactured articles of other countries.

Fortunately Canada is possessed of a very complete system of natural waterways in her great lakes and rivers, but unfortunately these are closed by ice from about November till April. The construction of railways became an absolute necessity, with the result that Canada has now also some of the finest railway systems in the world.

Waterways

First and foremost among the waterways are the *Great Lake Routes*, which, with the River St. Lawrence, provide a navigable highway with few obstructions, all of which have been overcome, right into the heart of the country. The distance from the Strait of Belle Isle to Fort William on Lake Superior by this route exceeds 2000 miles. Ocean-going vessels have always been able to ascend the river to Quebec, and a deepening of the channel now takes them to Montreal. From this point the traffic is conducted by lake steamers. The Lachine Rapids

THE LAKE ROUTES

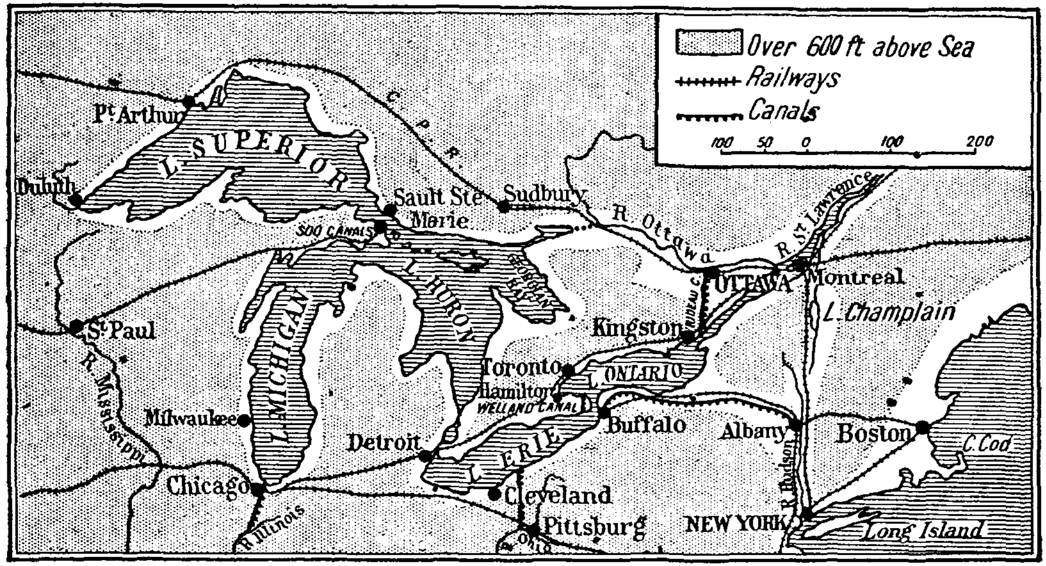


Fig. 36.

obstruct the passage to Lake Ontario, and the vessels in consequence ascend the *Ottawa River* to the capital, where the *Rideau Canal* leads into *Lake Ontario* at Kingston. The navigation of this lake to Hamilton at the western end is easy, but the ascent to Lake Erie has to be made by the twenty-six locks of the *Welland Canal*, which has been constructed to avoid the Niagara Falls. The route then proceeds by *Lake Erie*, the *Detroit River*, *Lake St. Clair*, the *River St. Clair* and *Lake Huron* to the rapids at

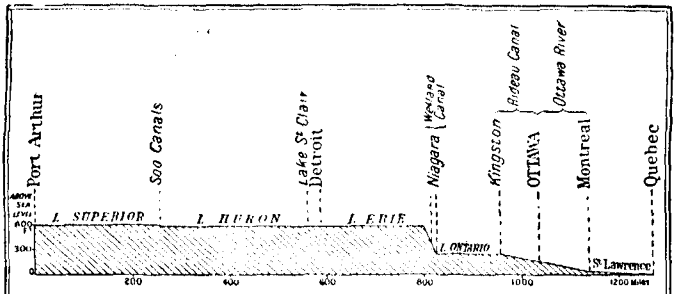


Diagram illustrating gradients along the Lake Route

(*Vertical exaggeration about 900 times*)

FIG. 37.

Sault Ste. Marie, which are avoided by the *Soo Canals* leading to *Lake Superior*. (Fig. 36.)

The vessels using this route carry manufactured goods imported from Europe and the United States, or manufactured in the eastern provinces for distribution in the west, and return heavily laden with wheat, timber and mineral ores. The total tonnage of shipping passing through the Canadian canals in 1918 was almost twice as great as that through the Suez Canal in the same period.

Proposals have been made for increasing the usefulness of this route by deepening the canals and

thus making them available for larger ships, and by shortening the route by the construction of a new canal. This will go from Georgian Bay on Lake Huron via Lake Nipissing to the Ottawa River, a distance of over 400 miles, of which only about fifty miles would be purely artificial. It will effect a saving of over 300 miles, that is, a good day's journey.

The lakes and rivers of the interior and the estuaries of the rivers of British Columbia are of considerable local importance.

The rapids of the *Nelson River*, some fifty miles from its estuary in Hudson Bay, are an obstacle to the navigation of the many rivers of the Lake Winnipeg system, the greatest of which, the *Saskatchewan River*, is navigable almost to the foot of the Rocky Mountains. As the population and production of the prairie provinces increase, it may be found worth while to overcome this obstacle by the construction of a canal.

Railways

For many years the settlements in Canada were simply clearings in the forest alongside the rivers and lakes, which were the sole means of communication. But when the prairies of the interior were discovered, and their great possibilities realised, the construction of railways became absolutely essential. For without them no one would dream of opening up a farm where he would be completely cut off from communication with the outside world, and where, however prolific his crops, he would be quite unable to market them. This fact was first seen and stated by Donald Smith, afterwards famous as Lord Strathcona, who had worked himself up from the position of a junior clerk to a most responsible position in the Hudson Bay Company. He had enormous difficulties to overcome in the misunderstandings and prejudices of the British public with

regard to Canada, but after years of hard labour and self-sacrifice, he not only lived to see the Dominion spanned from end to end by the iron road, but he also saw the *Canadian Pacific Railway*, which was completed in 1885, become one of the most successful commercial undertakings of the century, and the greatest factor in the enormous progress that Canada has made in recent years. For farms and mines were immediately opened up along the route, and countless branch lines and roads now lead off from it all over the prairie.

The main line runs from *Montreal*, alongside the Ottawa River to *Ottawa*, the Dominion capital, with its fine Parliament buildings and saw-mills. It then runs through the forests of Ontario to the copper and nickel mining centre of *Sudbury*, and continues by lake and river and forest to *Port Arthur* and *Fort William*, the great grain ports on Lake Superior. It still runs through country thickly forested, past the Lake of the Woods and eventually comes out on to the prairies at *Winnipeg*. In forty years this city has developed from the log-built fur-station of Fort Garry to the largest commercial centre of the plains and capital of Manitoba, with large grain-elevators, flour-mills, saw-mills and factories, modern buildings, wide streets and electric tramways. Railways now converge upon it from all points, several coming from the United States. The Canadian Pacific Railway runs westward across the wheat-fields through many thriving farming centres to *Regina*, the capital of Saskatchewan, and market centre of the enormous agricultural and ranching industries of the province. Crossing the cattle ranches and irrigated farms of Alberta the line reaches *Calgary*, a large town at the junction of the Bow and Elbow Rivers. The railway then climbs through the pine forests and magnificent scenery of the Rocky Mountains to the Kicking Horse Pass, which is a mile above sea-level. Descending to the valley of the Columbia River, it again ascends

to the Roger's Pass, which lies among the glaciers of the Selkirk Range. Again descending to the Columbia River, it then surmounts the Gold Range, and passing through a mining and fruit-growing country, reaches the valley of the Fraser River, which it follows almost to its terminus at *Vancouver*, 2906 miles from Montreal.

Some of its more important branches should be noted. From Montreal a line crosses the St. Lawrence by a bridge more than two miles long and runs through the province of Quebec and the State of Maine to *St. John* in New Brunswick, one of the great winter ports of the Dominion. Another very important one runs through the productive and well-peopled Lake Peninsula of Ontario via *Kingston, Toronto, Hamilton* and *London*, connecting with the United States Railways by tunnels under the St. Clair and Detroit rivers. There are branches from both Winnipeg and Calgary to *Edmonton*, the capital of Alberta, and one from Sudbury to *Sault Ste. Marie*. From *Medicine Hat*, in South Alberta, a branch climbs to the Crow's Nest Pass in the Rockies and serves the gold, copper and coal mining districts around *Rossland* and *Nelson*, and the fruit-farms of the Columbia and Okanagan valleys. (See Map, p. 239.)

The Canadian Pacific Railway is thus the great highway of Canada from east to west at all seasons. It unites mountain and prairie, taking wheat and meat to the mining camps in the Rockies, and bringing timber and fruit to the prairie farms. To the farmer and his family, tired of the monotony of the treeless prairie and oppressed with the burning heat of summer in the plains, it opens up possibilities of a holiday in the wooded lake land of the east and the forested snow-capped mountains of the west. It carries the produce of farm, forest and mine to the coast for export, and distributes the machinery, clothing and other factory products landed at its ports from foreign lands.

It might at any time have enormous strategic importance in the transport of troops and munitions, and it offers at all times a quicker route to China and Japan from England than by Suez. The Company own fine steamers that cross the Atlantic from Liverpool to Montreal or St. John, according to season, and the Pacific from Vancouver to Yokohama, Hong Kong and the eastern ports of Australia. The journey from Liverpool to Yokohama by this route only takes three weeks.

The Grand Trunk Pacific Railway is another transcontinental route, but the Rocky Mountain section is not yet complete. It runs from *Monkton* on the north shores of New Brunswick to *Quebec*, crossing the St. Lawrence by a high bridge. From Quebec it runs in an almost straight line through the lumbering regions of Quebec and Ontario to *Winnipeg*. From here it strikes north-westward for *Edmonton* and ascends the Rockies by easy gradients to the *Yellowhead Pass*, which is about as high as the summit of Snowdon. The route then descends into the upper valley of the Fraser, which it will follow to the great bend in the river and then continue across ridge and valley to the Skeena River, which leads towards *Prince Rupert*, its terminal port. This will offer a route to Yokohama 400 miles shorter than via Vancouver, and, on account of easier gradients, be a quicker and safer route than the Canadian Pacific Railway for the conveyance of heavy freight trains from the prairies to the Pacific coast.

The Canadian Northern Railway runs from *Port Arthur* on Lake Superior to *Winnipeg* and *Edmonton*. It has branches through Ontario to Montreal, and the Royal Line of steamships runs in connection with it to Avonmouth Docks, Bristol. It is proposed that the Canadian Government shall construct a connecting line with this railway from *Le Pas* on the Saskatchewan River, following the valley of the Nelson to *Port Nelson* on Hudson Bay. As this

port is as near to Liverpool as is Montreal, it will readily be seen that this route will be the shortest and quickest grain route from the middle and western prairies to England. Its drawback will, of course, be the very few months that Hudson Bay and Strait are free from ice.

The Intercolonial Railway, one of the oldest in the Dominion, connects *Montreal* with the winter ports of *St. John* and *Halifax*, and is wholly within Canadian territory. A ferry steamer for transporting trains connects this railway with the railways of Prince Edward Island.

The route to the Yukon Gold Fields is by steamer from Vancouver to *Skagway* on the Lynn Fiord in United States territory. From here a railway, some 100 miles in length, has been constructed over the *White Pass* in the Coast Range to *White Horse* on the *Lewes River*, down which a three days' journey by steamer leads to the mining centre of *Dawson City* at the confluence of the Klondike River. This route is only open from June to September.

Commerce and Seaports

Canada's trade with the outside world has shown a great and steady increase in the last thirty years, her exports now being almost five times and her imports over six times as great as they were at the beginning of that period.

The *exports* consist chiefly of the produce of her farms, mines, fisheries and forests, but the exportation of manufactured goods such as cheese, wood pulp, wooden manufactures and agricultural implements is considerable and increasing. In 1913, a quite normal year, *wheat* and wheat flour made up a quarter of the total exports, *forest products* accounted for over 10 per cent., and *cheese* and *silver* 5 per cent. each. The only type of goods that has shown a slight decrease in export value of recent years is animals and their products, such as meat, hides,

tallow, etc. This is probably due to the facts that more and more of the ranching land is each year being brought under the plough, and also the demand for these products is steadily increasing in the country itself with increase of population.

Canada's greatest customers for her produce are Great Britain and the United States, who took 44 and 42 per cent. of the total respectively in 1913. The mother country bought chiefly wheat and flour, cheese, timber and wood products, bacon, tinned fish and fruit; while the States purchased principally timber, silver, gold, copper and wood pulp.

The *imports* are mainly manufactured goods, *iron and steel goods* being by far the most important (15 per cent. in 1913), followed by *textiles*, *coal*, *sugar*, *tropical fruits*, *drugs* and *maize*. Sixty-three per cent. of the total came from the United States and 20 per cent. from Great Britain, the former supplying most of the iron and steel goods, the coal, drugs and maize, and the latter most of the textile goods, principally woollens and cottons. The sugar comes chiefly from the West Indies.

The *ports* taking a leading share in this trade are, on the Atlantic, the summer ports of Montreal and Quebec and the winter ports of St. John and Halifax; on the Pacific, Vancouver and Victoria, and, on the Great Lakes, Toronto.

Montreal is easily first in both exports and imports, in spite of the fact that it is closed from November till April, and it may be considered the commercial capital of the Dominion. It owes its importance to its commanding position, on an island, at the *convergence of a number of most important commercial highways. The St. Lawrence estuary* leads to the Atlantic, and ocean liners can come right up to its wharves and docks, which stretch for a mile along the river front. The *Great Lake Routes* converge upon it, bringing grain and minerals. The *Ottawa River* leads up to the Dominion capital and

the greatest lumbering region of the country. The *valley of the Richelieu River* gives direct access by rail and canal to the Hudson Valley and New York. The *Canadian Pacific Railway*, whose great workshops are in the city, brings in grain and cattle from the prairies, fruit and minerals from the Far West, and dairy produce and fruit from the fertile Lake Peninsula of Ontario. These routes facilitate the collection of coal and raw materials, leading to large manufacturing industries, which also receive assistance from water-power derived from the Lachine Rapids at the exit of Lake Ontario. Montreal received 22 per cent. of the total imports and despatched 21 per cent. of the exports in 1913.

Toronto is the second largest city of the Dominion and the capital of Ontario. Owing to its position in the most productive and densely peopled part of Canada and on the shores of Lake Ontario, it has a large import trade, especially from the United States, and in this respect is second only to Montreal. It has important manufactures and magnificent Parliament buildings and University.

Vancouver is the fourth city of the Dominion in point of size, being exceeded by Winnipeg, but is the third seaport. It has a magnificent natural harbour in Burrard Inlet, and is the western terminus of the Canadian Pacific Railway. Its hinderland is productive of timber, fruit and minerals, and coal and iron can be obtained from Nanaimo on Vancouver Island. It has therefore developed saw-milling, smelting and engineering industries, and has a sugar refinery. It has regular steamship services to China, Japan and many west-coast ports of America.

Quebec is relatively less important than formerly, the deepening of the St. Lawrence up to Montreal having adversely affected it. As the oldest city in Canada it is full of historic interest. It has large timber and leather industries, and is the landing-place of many immigrants in the summer months.

Rimouski, lower down the river and on the opposite shore, is the port at which the mails are landed and taken aboard.

Halifax has a deep, safe and always accessible harbour, and is well fortified. The country behind it is productive and has good supplies of coal. It is the terminus of the Intercolonial Railway, and one of the great winter ports. It is an important naval station.

St. John is the largest and busiest city of New Brunswick, and has a good harbour at the mouth of the St. John River on the Bay of Fundy. Since the Canadian Pacific Railway has been extended to the port its trade has exceeded that of Halifax. It has saw-mills and many small factories. It is the winter port for the Canadian Pacific liners from Liverpool.

Victoria, the capital of British Columbia, lies on a good harbour at the southern end of Vancouver Island. It is connected by rail with fruit-growing, lumbering and coal-mining districts along the east coast of the island.

The trade between Canada and the mother country is carried on by a number of well-known shipping lines that run regular services from Liverpool, Glasgow, London, Southampton and Bristol. The journey usually takes about a week or ten days, being often prolonged on account of fogs over the Banks of Newfoundland and the St. Lawrence estuary. These fogs are due to the warm, moist air over the Gulf Stream Drift being drawn into the cold layers of air over the cold Labrador Current, which flows down the east coast. In spring, when the ice breaks up in the northern seas, huge icebergs, broken from the glaciers of Greenland, often drift down in this current and are a source of great danger to shipping.

CHAPTER XXXIX

THE DOMINION OF CANADA (*continued*)

POPULATION AND GOVERNMENT

Distribution of Population—Immigration—The various Provinces and their Development—Native Races—Government.

CANADA, although nearly as large as Europe, has a population only as large as that of Greater London. Thus, in spite of the fact that in the north there are large, barren tracts which will never support even a moderately dense population, it is obvious that to speak of Canada as overcrowded, as is sometimes done, is absurd. The only parts that are beginning to be well peopled are the first-settled eastern provinces, and a narrow strip along the southern boundary where railway development has opened up the country in recent years. It seems probable that for many years to come Canada will remain largely an agricultural country, and thus the population will remain much less concentrated than in Great Britain, although the increasing demands of a growing population for manufactured articles will encourage the growth of densely peopled industrial centres, where conditions are favourable. It is of interest to notice that the most densely peopled province, Prince Edward Island, is the only one that showed a decrease in population at the last census; showing that when the density of population had reached fifty to the square mile, that is less than in the least-populated county of Ireland, many found it worth while to migrate to the farming districts of the western prairie. The census of 1911 showed the population of the provinces of Saskatchewan and Alberta to be five times what it was ten years before.

The number of immigrants arriving in Canada shows

a steady increase each year. In 1913 they numbered over 400,000, of which 40 per cent. came from Great Britain and 35 per cent. from the United States, most of the rest coming from European countries.

Canada is open to immigrants of all nationalities, provided they are of good health and character and possess at least five pounds, if they land during the summer months, or ten pounds in the winter. Chinamen, however, must pay a tax of £100 on landing. In the prairie provinces and certain parts of the other provinces settlers may receive a free grant of 160 acres, on payment of a registration fee of two dollars and undertaking to develop the property. Such a grant is, however, useless to any one who has not a capital of £300 or more, according to local conditions, and most settlers work on a farm till they have accumulated sufficient capital and experience to take up a holding for themselves.

The population and opportunities of development of the various provinces may be considered separately.

Prince Edward Island is the smallest province, being about as large as Northumberland. About a fifth is still covered with forest, the rest being cultivated or used as cattle pasture. Owing to its small size, accessibility, good climate, fertile soil and nearness to good markets, its farms are very valuable. As pointed out above, it is the most densely peopled province, having forty-three persons to the square mile; but its population is declining, and as there are no minerals in the island it will probably never become really thickly populated. Its fisheries, especially of lobsters and oysters, are particularly valuable, and ranching of the fur-bearing silver fox has recently been established as a profitable industry. *Charlottetown*, the largest city and capital of the province, has only 11,000 inhabitants.

Nova Scotia, with twenty-three persons to the square mile, is the next most densely peopled province, but, although it is almost three times as large

as Wales, it has only a quarter as many people. The population is steadily increasing and should continue to do so, for it has valuable forests, fisheries and mines, all capable of further development; its climate is healthy and winters are not too severe; and its soil is fertile and suitable for growing fruit, especially apples, and for dairy farming. Its harbours are open all the year round, it has good railway communication, and manufactures are rapidly developing. *Halifax*, the capital, has nearly 50,000 inhabitants, and *Sydney*, the centre of the coal mining and manufacturing area of Cape Breton Island, has 18,000.

New Brunswick has thirteen people to the square mile, and is nearly as large as Scotland. Its industries are similar to those of Nova Scotia, but its mineral resources, especially of coal and gold, are not nearly so great. *St. John* is the only large city, having 43,000 people, but *Fredericton*, with only 7000, is the capital of the province.

Ontario, three times the size of the British Isles, has only just over two and a half million people, or ten to the square mile. The population is, however, very unevenly distributed, large areas in the north being practically uninhabited, while the Lake Peninsula in the south is probably the best-developed part of the Dominion, having rich dairy and fruit farms and busy manufactures. The industrial population is increasing rapidly, but the rural population shows a decline in recent years. There are four really large cities. *Toronto*, the provincial capital, has 377,000; *Ottawa*, the Dominion capital, 87,000; *Hamilton* 82,000, and *London* 46,000 people. With its great forest and mineral resources, its ability to feed a large population, and its magnificent system of waterways and railways facilitating the collection of raw material and distribution of finished products, Ontario will probably become the great manufacturing province of the Dominion.

Manitoba, nearly twice as large as the British Isles,

has not quite half a million people, averaging about six to each square mile. *Winnipeg* (see p. 268), the capital and only large city, has 136,000 inhabitants, and is the third city of the Dominion. The wealth of the province lies in its rich soil, especially in the valleys of the Assiniboine and Red rivers. About six million acres are cultivated, half being under wheat. The completion of the proposed Hudson Bay Railway will develop the more northern parts of the province, although large areas will probably remain only fit for the fur trade. The mineral wealth of the province does not seem to be great.

Quebec, the oldest province, is also the largest, being nearly six times as large as the British Isles, but as large areas to the north are bleak and barren, it has a population of only about six to the square mile. Of its 2,000,000 inhabitants, nearly three-quarters are French-speaking. The most English portion of the province is on the south shore of the St. Lawrence, where agriculture, dairy-farming, the maple-sugar industry and mining of asbestos are the principal occupations. On the north side of the river is the greatest lumbering region of the Dominion. *Montreal* (see p. 272) is the largest city and the commercial capital of Canada, having 470,000 people. *Quebec*, the provincial capital with 78,000, is the only other large city.

Saskatchewan is now the greatest wheat-growing province, the acreage and production of this crop exceeding twice those of Manitoba in 1913. Its population is still only about two persons to the square mile, in spite of the fact that it has increased over five times during the last ten years. A considerable area is still devoted to cattle-ranching and dairy-farming. *Regina*, the capital and largest city, has 30,000 inhabitants.

Alberta is another rapidly developing province, but in spite of the fact that its population is more than five times as great as it was ten years ago, there are

still less than two people to the square mile. The recent increase here, as in Saskatchewan, is due to the construction of railways and the change from ranching to agriculture, which irrigation and more scientific farming have made possible in the drier parts of the prairie. Around the lakes and rivers of Northern Alberta are some 10,000 square miles of valuable forests; in the centre, around Edmonton, are enormous coal-fields, estimated to contain 90,000 million tons; and in the south, around Medicine Hat, are great supplies of natural gas; so there are many reasons why Alberta should continue to develop at a rapid rate. *Calgary*, on the main line of the Canadian Pacific Railway, is the largest city, with 85,000 people, and *Edmonton*, the capital, has 72,000.

British Columbia, farthest from the mother country and shut off from the rest of the Dominion by the great barrier of the Rocky Mountains, was the last to develop, and even now has only about one person to each square mile. But in spite of the fact that so much of the province is mountainous, it has a great future before it, for the resources of its forests, mines and fisheries are probably greater than those of any other province in the Dominion; its climate is more congenial; it is served by two trans-continental railways; the opening of the Panama Canal puts it within three weeks' voyage of Great Britain; and other countries lying around the Pacific Ocean are developing very rapidly.

The North-West Territories and Yukon are very scantily peopled, and owing to the severity of their climate are likely to remain so, unless further rich finds of gold are made; so that it will pay to carry there the means of making life endurable in such a region.

Native Races

There are still living in Canada nearly 5000 native *Eskimos*, and about 100,000 *Red Indians*, but the numbers of both seem to be on the decrease.

The *Eskimos* live in groups of twenty or thirty families, dwelling in skin tents during the long, light, summer days, and in ice huts during the long, dark winter. They are a short, dark race of people, and live exclusively on fish or other products obtained from the Arctic seas, on whose shores they make their home (see p. 252). They are especially clever at harpooning seals, which they pursue in their skin-built kayaks.

The *Indians* seem to have been demoralised by contact with the white man, whose vices and diseases they have contracted with disastrous results to themselves, so that they are fast dying out. The keen, intelligent, strong, fearless and altogether magnificent chiefs that figure in the idyllic poems of Longfellow and the thrilling romances of Fenimore Cooper have passed away. A few retain the hunting instinct, and engage in the fur trade in the northern forests; others live in ragged wigwams on the prairie along the railway, living mainly on the charity of passing travellers or by selling objects they have made from leather and birch bark, which two materials have always figured very largely in the economy of the Red Indian.

Government

Canada is self-governed, having a somewhat similar form of government to that of the mother country. The King is represented by his own appointed Governor-General, who nominates a Privy Council, corresponding to the Cabinet, to assist him. Legislation is in the hands of a Parliament consisting of a Senate and a House of Commons. The Senators are nominated by the Privy Council and appointed for life by the Governor-General, each province having some Senators, although not a fixed number. The House of Commons is elected every five years, the province of Quebec always having sixty-five members, and the other provinces a proportional number based

on the population, *e.g.* Ontario now has eighty-six members and British Columbia seven. The members are paid.

Each of the nine provinces has a separate Parliament, with a Lieutenant-Governor, appointed by the Governor-General, for the management of its internal affairs. Some provinces have two Chambers similar to the whole Dominion, others have only one.

Yukon is governed by an appointed Commissioner and an elected Council of ten, the North-West Territories by a Commissioner and Council of four, all appointed by the Governor-General.

Ottawa, hitherto an obscure lumbering village, was chosen to be the capital of the Dominion in 1867 to avoid the conflict of the claims of the older and larger cities, such as Quebec, Montreal and Toronto. The magnificent Parliament buildings, which were recently partially destroyed by fire, are worthy of the Dominion and the Empire.

CHAPTER XL

NEWFOUNDLAND

Physical Features and Climate—Fishing and other Industries—Commerce.

NEWFOUNDLAND, our oldest colony, is about three-quarters the size of England and Wales, and physically bears considerable similarity to the mother country. The Strait of Belle Isle, only ten miles wide, separates it from the mainland of North America, and the shallow seas covering the continental shelf around it are similar to those around the shores of Great Britain, indicating that it was at one time probably attached to the mainland. In both cases the shallow seas are valuable fishing-grounds.

The highest land, too, lies to the west, and Long

Range, reaching a height of nearly 2000 ft., seems to be a continuation of the mountains of Nova Scotia and the Appalachian System. The coast is very indented, especially on the Atlantic side, and there are many fine harbours. The trans-Atlantic cables, which leave Valentia Island in South-West Ireland, are landed in Trinity Bay, and leave Placentia Bay, across a narrow isthmus, for Canada and the United States. Cape Race, in the south-east corner, is a well-known signalling-station for trans-Atlantic liners, and now has a powerful wireless installation, capable not only of communicating with ships at sea, but also of sending messages right across the Atlantic, a distance exceeding 1600 miles.

Smaller mountain ranges cross the island parallel with the west coast. The ridges have suffered greatly from denudation by ice and are very barren, but seem to be rich in minerals, which have not yet been exploited to any great extent. The intervening valleys are well timbered, and contain many long, narrow, picturesque lakes and rivers with numerous waterfalls. The timber is not large, but is excellent for making wood pulp, and this industry is rapidly increasing, the mills being worked by water-power. Where the forests have been cleared, notably in the valleys of the Humber and Gander rivers, there is rich agricultural land awaiting development.

The *climate* is not so extreme as on the mainland, but the winters are cold on account of the Labrador Current, and the summers are mild, making Newfoundland a popular holiday resort for well-to-do Canadians and Americans. The rainfall is heavy and well distributed throughout the year, being brought by cyclones, as in the mother country. There is too much rain for successful wheat-growing, but oats and barley are grown, and large crops of hay and various roots for cattle food. The island is famous for large quantities of wild berry fruits of various kinds, some of which are exported.

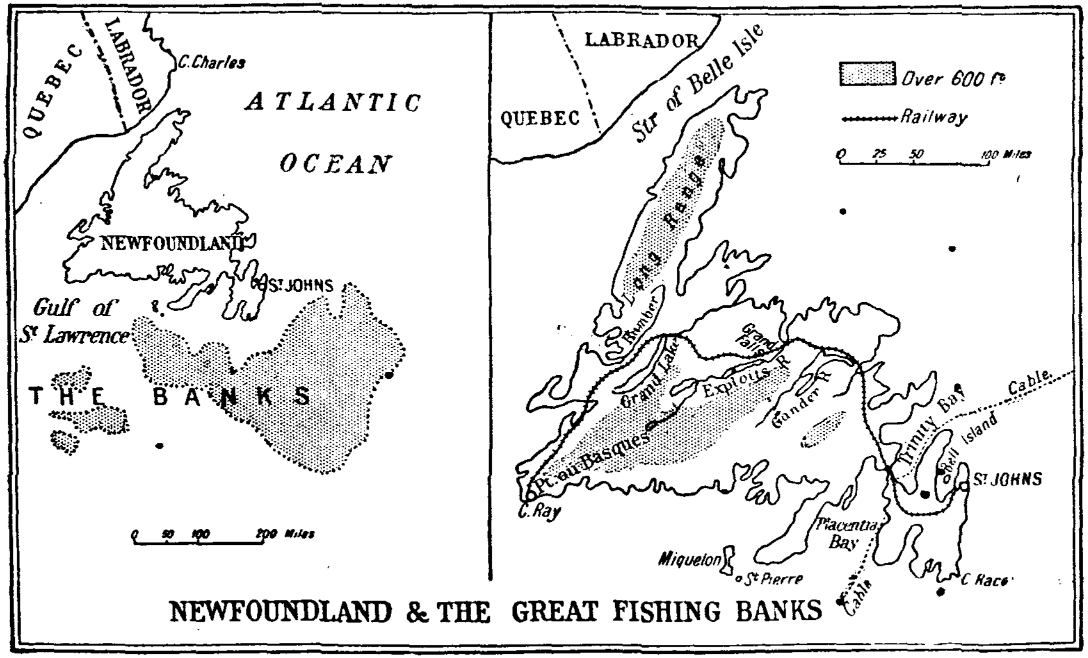

QUEBEC
LABRADOR
C. Charles
ATLANTIC
OCEAN
NEWFOUNDLAND
St JOHNS
Gulf of
St Lawrence
THE BANKS
0 50 100 200 Miles
LABRADOR
QUEBEC
Str of Belle Isle
Over 600 ft
Railway
0 25 50 100 Miles
Long Range
Humber
Grand Lake
Grand Falls
Exploits R
Gander R
Pt. au Basques
C. Ray
Trinity Bay
Bell Island
Cable
St JOHNS
Placentia Bay
Miquelon
St Pierre
Cable
C Race
NEWFOUNDLAND & THE GREAT FISHING BANKS

FIG. 38.

Newfoundland, like Great Britain, has an evil reputation for fogs, but this is only true to any extent of the coasts and neighbouring seas. These fogs are due to passing cyclones, drawing the warm, moisture-laden air, which lies over the Gulf Stream Drift, further out in the Atlantic, into the cold layers of air above the Labrador Current that flows close inshore.

Industries and Productions

Fishing is the great industry of Newfoundland. About a third of the population take part in it, and this, of course, means that many more are entirely supported by it. As a result agriculture and mining have been greatly neglected, and in spite of the other resources of the country fish and fish products constitute five-sixths of the total exports. The greater number of fishermen are engaged in the inshore fisheries, catching *cod, herring* and *lobsters*, but over 100 boats and 2000 men go to the Grand Banks for the cod-fishing between June and November. These banks cover an area as large as Great Britain, and lie to the south-east of Newfoundland. They have been covered in the course of centuries with rock debris, deposited from the melting icebergs brought down by the Labrador Current, which also brings down from the northern seas quantities of floating organisms upon which fish feed. These cool, shallow waters, with their abundant food, are chosen annually by the cod as spawning-grounds.

In late spring a number of fishermen hunt the *seals*, which then abound on the ice-floes round the north-eastern shores and along the coasts of Labrador. These seals are not valuable for fur, but for their oil and skins, the latter being made into leather. A few vessels go northward for *whale-fishing*, which provides exports of oil, whalebone and manure.

Three-quarters of the fish caught are exported, mainly to Brazil, Spain and Italy.

After fish, *iron ore* is the most valuable export. The richest deposits are on Bell Island in Conception Bay, and the ore only needs quarrying. Most of it is exported to Sydney in Cape Breton Island, for although there are coal measures in the south-west of Newfoundland—really a continuation of the Nova Scotian field—they have not yet been developed.

Copper, *gold*, *silver* and *lead* are mined in small quantities in the south-east of the island.

Wood pulp and *paper mills* have been established by a well-known English newspaper firm at Grand Falls.

A railway runs through the island from the capital, St. John's, passing at the head of the inlets along the north-east coast to the mouth of the Exploits River. It then strikes westward to the coal-field at the northern end of Grand Lake, and then runs southward to Port aux Basques near Cape Ray.

St. John's, the capital and only town of any size, has a fine harbour, and is the port of call for steamers from Great Britain, Canada and the United States. These three countries share the import trade of the colony, the principal articles being flour, textiles, machinery and coal. Two-thirds of the total exports consist of dried cod, the rest being made up of tinned lobster, herrings, seal-skins and oil, iron ore and a little copper. Various Roman Catholic countries are the chief customers for the first-named, and the United Kingdom, Canada and the United States share most of the rest.

The colony is self-governing, the Governor, appointed by the King, being assisted by Executive and Legislative Councils and an elected Assembly. The Government also controls the long, narrow, bleak, barren and very thinly peopled strip of Labrador.

CHAPTER XLI

BRITISH WEST INDIES

Physical Features and Climate—Productions and Industries—Communications and Commerce—Population and Government.

Position and Physical Features. Most, although not the largest, of the chain of islands that stretch from Cape Sable to the mouth of the Orinoco are now in British possession, and the fortified coaling-stations that have been established at the good natural harbours of Kingston in Jamaica and Castries in St. Lucia are of great strategical importance in controlling the trade routes to and from the Caribbean Sea and the Gulf of Mexico, especially the easiest and most frequented routes by the Windward, Mona and Barbadoes passages. This importance has been increased by the opening of the Panama Canal, which will bring much more shipping on to these routes. It may be noted that Kingston is the nearest fortified coaling-station to the canal, being only a day's journey for a fast cruiser from Colon.

The total area of the islands is about 12,000 square miles, the largest, Jamaica, being about as large as Northumberland, Durham and Cumberland taken together. It consists of a mountainous " backbone " running from east to west, and reaching a height of a mile and a half above sea-level in the Blue Mountains, with lower plains to north and south. Of the other islands the Bahamas are low and of coral formation, while the rest consist of the slopes of active or extinct volcanoes, sometimes fringed with coral reefs. The whole region is subject to volcanic outbursts and frequent earthquakes; the eruption of La Souffrière, in St. Vincent, destroying 2000 lives in 1902, and the earthquake which wrought great havoc in Kingston in 1907 being the most recent disasters. However,

the decayed lava rocks make most fertile soil, and therefore, unfortunately, the volcanic islands are the most productive and most densely peopled. The low elevation and porous rock of the coral islands cause an absence of streams and rivers, so that water-supply is a difficult problem.

CLIMATE. Lying almost entirely within the tropics, the islands have always a high temperature, ranging from about 75° F. in the cooler months to 5° F. from May to October. The prevailing winds are the Trades, the north-east in the cooler and the south-east in the hotter months. These bring rain at all seasons, but the latter bring the largest quantity. Mean annual rainfall varies considerably from island to island and from year to year, 40 in. being a minimum and 200 in. a maximum, while about 60 in. can usually be relied upon.

The climate is on the whole healthy, especially in the drier "winter" months, when the north-easters are particularly bracing; this and the mild temperature making the West Indies increasingly popular as a winter resort for visitors from Europe and the United States. Even the summers are not so "steamy" and malarial as in many places in similar latitudes, owing to the sea winds.

The Trade Winds make the east coasts of the island surf-beaten and dangerous to shipping, and it will be noticed that all the larger and more important seaports have been established on the western, or leeward, sides of the islands. From August till the end of October fierce hurricanes sweep the islands, doing much damage to ships, houses and crops.

PRODUCTIONS AND INDUSTRIES

Agriculture. The great value of the West Indies to foreign commerce has always been, and still is, in their many plantation products. Bristol and Glasgow grew into importance in the seventeenth and

eighteenth centuries by importing and manufacturing *sugar*, *cocoa* and *tobacco* grown in the islands. The European bounty-fed beet-sugar industry and the abolition of slavery, however, almost killed the sugar-planting, which was the staple industry of the West Indies; but the application of new methods of culture and refining, and the closing of the chief sources of Britain's supply of beet-sugar by the recent war are bringing about a revival. In the meantime the production of *bananas* and *cocoa* for the United States and British markets has greatly exceeded that of sugar in most of the islands, the former particularly in Jamaica, and the latter in Trinidad and Tobago. A special line of steamships, plying between Kingston and Bristol, is subsidised by the colony and the mother country to keep up a fast service of vessels fitted with refrigerators for the important banana trade, which is of quite recent growth. *Pineapples, oranges* and other fruits are also exported in smaller quantities.

Jamaica also grows and exports *coffee* of good quality and *coconuts*, the former being a hill-side crop and the latter obtained from the palms that fringe the shores. Barbadoes still has thriving sugar plantations, and exports *sugar, molasses* and *rum*, but it is also very successful with the excellent long-staple *sea island cotton*, plantations of which are also found in St. Vincent, St. Kitts, the Virgin Islands and Trinidad. St. Vincent is famous for *arrowroot*, and Grenada exports *mace, nutmegs* and other *spices*, as well as cocoa. Montserrat is noted for its *limes*. *Balata gum*, a sort of rubber obtained from trees in Trinidad, *logwood extract*, the product of a tree grown in Jamaica and used for making brown and black dyes, and *sisal hemp fibre*, grown in the Bahamas, are other valuable vegetable exports.

Mineral wealth is very small, but most of the *pitch* used in caulking seams of ships and in tar paving is obtained from Trinidad. It is dug out of a " pitch lake " some hundred acres in extent in the south-west

of the island at La Brea, the lake gradually filling from below after the hardened surface layer has been removed. This is probably due to a natural distillation of coal seams below the surface by the internal heat of the earth; and the petroleum wells, which have recently been struck in the island, are probably another manifestation of the same agency. *Manjak*, a sort of pitch used chiefly as fuel, is also found in Barbadoes. *Salt* is obtained by the natural evaporation of sea-water in the lagoons that fringe the shores of some of the coral islands, notably the Bahamas and Turks and Caicos Islands. It is simply raked from the bottom of the dried-up lagoons. Deposits of *guano* on some of the uninhabited islands, which are the resorts of flocks of sea-birds, have a commercial value for the making of manures.

Sponges of inferior quality are obtained from the shallow waters around the Bahamas.

Communications and Commerce

Most of the islands being small, and most of the plantations and towns lying on the fertile coastal plains, there is little need for roads or railways. In Jamaica, however, there are about 200 miles of railway of the ordinary English gauge. The lines run from the capital, Kingston, to Port Antonio on the north-east and Montego on the north-west coast of the island. Trinidad also has about 100 miles of railway, the chief line connecting the pitch-lake district in the south-west with Port of Spain, the capital and chief seaport. There are a few miles of narrow-gauge railway in Barbadoes. Most of the larger islands have a telephone service, and are linked together by submarine cable. Cable connection with the mother country is via Bermuda and Halifax (Nova Scotia). There are wireless stations in Jamaica, Trinidad and the Bahamas.

The *exports* of the islands chiefly consist of the

various plantation products mentioned above, *bananas* from Jamaica and *cocoa* from Trinidad being by far the largest single items, each exceeding a million and a quarter pounds in annual value. The total exports of the British West Indies amount to nearly 10 million pounds per annum, Trinidad accounting for nearly a half and Jamaica over a quarter of the total. The mother country receives about a quarter of the exports and the United States most of the remainder.

The *imports*, which slightly exceed the exports in value, consist mainly of textiles, chiefly *cotton goods*, *machinery*, *flour*, *provisions* and *coal*. About a third of the total comes from the United Kingdom, most of the rest coming from the United States, which have the great advantage of proximity. The chief ports of the colony are Kingston, Port of Spain, Bridgetown in Barbadoes, and Castries in St. Lucia.

Kingston has a fine harbour sheltered by a sand-spit about six miles long, and on the end of which, at the entrance to the harbour, are the fortifications of Port Royal. The Blue Mountains protect the harbour from the violence of the North-East Trades. Roads and railways connect it to all the chief towns on the island. Its nearness to the Panama Canal and its situation at the point of divergence of routes from there to Great Britain, the United States and Canada, add to its importance.

Port of Spain is situated on a bay at the north-west corner of Trinidad. It exports large quantities of cocoa, sugar, balata gum and asphalt, the value of its trade being larger than that of any other port. It acts as an *entrepôt* for the neighbouring corner of Venezuela.

Bridgetown is the capital of Barbadoes, the most flourishing of the smaller islands. Sugar-planting, with the consequent industries of making molasses and rum, are most important, but cotton is being increasingly grown for export. Manjak is also dug out and exported, and the harbour has a considerable fishing fleet.

Castries, on St. Lucia, is one of the finest harbours in the West Indies, being picturesquely situated between two volcanic mountain spurs, each about 800 ft. high. It is a naval coaling-station.

The principal shipping lines between the West Indies and the mother country are the Imperial Direct West Indian Mail Line, running between Bristol and Jamaica, and the Royal Mail Steam Packet, from Liverpool and Southampton to Bridgetown, Port of Spain and Kingston, with branch services to the other islands. Many other cargo boats also call. Seventy per cent. of the shipping is British.

Population and Government. The population of the West Indies is under two millions, about half living in Jamaica. Barbadoes, which is the least mountainous and most fertile of all the islands, is the most densely peopled, having about 1100 people to each square mile. The Bahamas have only a density of 14.

By far the largest number of people are negroes, descendants of the old African slaves on whose labour the sugar-planting industry was built up in the seventeenth and eighteenth centuries. The brutal enslavement of the native Caribs by the Spanish and Portuguese had previously almost depopulated the islands, and very few of them remain. In Jamaica, negroes outnumber Europeans by forty to one, and other coloured races by four to one. Since the suppression of the slave trade, indentured East Indian and Chinese coolies have been introduced to assist on the plantations. The direction of government, education and industry is mainly in the hands of the British.

For the purposes of government the West Indies are divided into six Crown Colonies, each under a Governor assisted by a Council, some of whose members are elected. The groups are: (1) *The Bahamas*, capital Nassau on Providence Island; (2) *Barbadoes*, capital Bridgetown; (3) *Jamaica*, with Turks, Caicos and Cayman Islands, capital Kingston; (4) *The*

Leeward Islands, including Antigua, the capital, St. Kitts, Dominica, Montserrat and the Virgin Islands; (5) *The Windward Islands*, including Grenada, the capital, St. Vincent, the Grenadines and St. Lucia; (6) *Trinidad and Tobago*, capital Port of Spain.

CHAPTER XLII

OTHER AMERICAN POSSESSIONS

British Guiana—British Honduras—The Bermudas—The Falkland Isles.

British Guiana

This is a Crown Colony about as large as Great Britain, lying on the north coast of South America. It has about 250 miles of coast line along the Atlantic Ocean, and extends inland about 600 miles to the head-waters of the Essequibo River; this and the Demerara and Berbice rivers being the principal means of transport and communication in the colony. South of the broad lowlands rise the Guiana Highlands culminating in Mount Roraima, a mile and a half high, the last 1500 ft. of which rise as a sheer precipice, down which rush the celebrated Kaietur Falls, which may one day be utilised as a great source of power.

The *climate* is hotter and more unhealthy than that of the West Indies, especially along the swampy coast, and the rainfall averages about 140 in. a year, being mainly brought by the North-East Trades from the Atlantic.

Consequently vast areas are covered with tropical jungles, which may be exploited for timber, rubber and other forest products when communications are improved and as more is known of the cause and cure of tropical diseases. As it is, considerable quantities

of *balata*, a kind of rubber, and small quantities of *timber* are already exported.

The most valuable part of the colony, however, is a strip of low-lying land about five miles wide along the coast. This has been built up in the course of ages by the alluvium brought down by the rivers, and having been drained by the construction of dams and dykes by the original Dutch settlers, the reclaimed "polders" produce fine crops of *sugar-cane, cotton, rice* and other tropical products. Sugar and the allied products of *molasses* and *rum* constitute the bulk of the exports, and maintain most of the population.

In the far interior are stretches of park-like savanna which may some day be utilised for cattle-rearing, as in the neighbouring country of Venezuela.

Gold is found in the streams and rivers, and there are probably large stores of the mineral in the forested mountains of the interior from which they come.

The sugar-beet industry of continental Europe has given a great set-back to the development of the colony, but recent events, and the possibility of developing its other vegetable and mineral resources, should make its ultimate progress certain.

Its *exports* amount to nearly two million pounds in value per annum, *sugar* accounting for more than half, *gold, rum* and *balata* being next in order. The United Kingdom and Canada are the best customers, the latter taking most of the sugar. Clothing, machinery and various foodstuffs constitute the bulk of the imports, over half of which come from the United Kingdom and about a quarter from the United States.

Georgetown, a low-lying but beautiful tropical town at the mouth of the Demerara River, is the capital and chief seaport of the colony. A railway, about 60 miles long, connects it with New Amsterdam at the mouth of the Berbice River.

The numbered population of British Guiana is less than 300,000, but in the forests of the interior there are some native "Indian" tribes, living by

primitive agriculture and fishing, along the river banks. About a third of the population are descendants of the African negro slaves, and another third are East Indian coolies introduced since the abolition of slavery. There are also some Portuguese labourers recruited from Madeira, and some Chinese. The planters are British, Portuguese or Dutch.

British Honduras

This Crown Colony, a little larger than Wales, has only about 40,000 people, very few of whom are Europeans. It is low and swampy in the north, rising to the south and west. Its climate is hot, wet and unhealthy, and the whole country is thickly forested. At present forest products are its only sources of wealth, its great export being *mahogany*, the logs being floated down the rivers to the coast in the rainy season. *Chicle gum*, exuded from a tree and used in making the chewing-gum so largely consumed in the United States, is the next most valuable export, after which come *cedar*, *coconuts*, *bananas* and *logwood*.

The chief town and seaport is *Belize*, at the mouth of a river of the same name. Besides the products of the colony, it collects similar produce from the neighbouring parts of Guatemala and Yucatan for export. It, however, has no harbour, and the mahogany logs are taken on board ship in the roadstead, which is protected by coral reefs. Other produce is brought out in flat-bottomed boats.

The Bermudas

This is a remarkable group of islands lying about 600 miles east of the United States and half-way between Nova Scotia and the West Indies. They form parts of the broken ring of an *atoll*, or roughly circular coral island, built up on a submerged mountain ridge. Coral polyps only build in warm, tropical waters, and the existence of this group, 600 miles north of the

tropic of Cancer, is accounted for by the warm waters of the Gulf Stream flowing towards Western Europe from the Strait of Florida. Several hundreds of the islands are charted, but only about twenty are inhabited. The area of these is only nineteen square miles, yet they support 19,000 people.

The *climate* is warm, mean summer temperatures exceeding 80° F., and winter temperatures exceeding 60° F. The mild winter makes them a favourite resort of wealthy Americans, especially from the New England States, where the winters are very severe. It also encourages the chief industry of the islands, viz. the growth of early fruit and vegetables for the American market (*cf.* the Channel Islands and Great Britain).

The rainfall is sufficient, but, owing to the porous nature of the coral rock, there are no lakes, streams or rivers, and the inhabitants are dependent for their water-supply upon rain-water caught in cisterns.

The *commerce* is small, and is mainly carried on with the United States. Textiles and foodstuffs are the principal imports, and early vegetables the chief exports.

There is cable communication with Halifax and Jamaica and regular steamer connection with New York.

Hamilton, the largest town and port, is a naval dockyard and a fortified coaling and victualling station for the British Navy in the North Atlantic.

A third of the population are whites, the rest being negroes and mixed races, as in the West Indies.

The Governor and Executive Council are appointed by the Crown, but there is also an elected House of Assembly.

The Falkland Islands

This group lies in the South Atlantic about 300 miles east of the Strait of Magellan, and in a corresponding latitude to that of London. There are

about 100 islands in the group, equal together to about the size of Wales, but only two of them are inhabited. South Georgia, with a whaling settlement, and the South Orkneys, with a meteorological observatory maintained by the Argentine Government, lying about 1000 miles to the east and south-east, are attached to the Falklands for administration.

The Falklands are very hilly, exceeding 2000 ft. in parts, and the coasts are very rugged. Lying in the track of the stormy Westerlies, the climate is not pleasant. The temperature is equable, but always cool, and the rainfall, which is regularly distributed throughout the year, averages about 30 in. per annum at *Port Stanley*, the only town. High winds prevent the growth of trees, and coarse grass and stunted bushes are the chief forms of vegetation. Peat from the swamps is the chief fuel. *Oats* and *barley* sometimes ripen, but wheat never. Consequently, pastoral industries are the only means of livelihood, and large flocks of *sheep* are kept, giving rise to the staple exports of *wool* and *tallow*.

Whale-oil and *whalebone*, the products of the South Georgian whale fisheries, are exported from Stanley, and sometimes exceed in value the pastoral products. Most of the trade is carried on with the mother country, from which there is a monthly mail service.

Port Stanley, the capital, with less than 1000 inhabitants, has a good harbour and workshops for executing small repairs to ships. It is frequently visited by ships, especially sailing vessels, that have received a heavy battering in the passage round Cape Horn. A wireless station has been recently established there, and from the harbour set out the British Fleet which destroyed the German Pacific Cruiser Squadron in 1915.

The population of just over 3000 are mainly of mixed European descent, and the government is that of a Crown Colony.

PART VI

AUSTRALASIAN POSSESSIONS

CHAPTER XLIII

THE COMMONWEALTH OF AUSTRALIA—DISCOVERY AND DEVELOPMENT

LITTLE was known of the Island Continent before the end of the eighteenth century, although a half-mythical Terra Australis, the great South Land, had figured on many ancient maps. The Dutch seem to have been the first to have given any description of the country. From their settlements in the East Indies several navigators had reached the north and west coasts, but were deterred by unhealthy jungle and waterless desert, to say nothing of the savage aborigines, from going far into the interior. Dutch names along these coasts, such as Van Diemen's Gulf, Dirk Hartog Island and Cape Leeuwin testify to these visits.

Abel Tasman, a Dutch sailor, was probably the first to circumnavigate the continent. Sent out from Batavia, in Java, by Governor Van Diemen in 1642, he rounded Cape Leeuwin and, carried by the Roaring Forties, reached the island now known as Tasmania, but called by its discoverer Van Diemen's Land. Leaving the island, and still assisted by the Brave West Winds, he reached New Zealand, but did not risk landing in face of the hostility of the native Maoris. Sailing due northward, he eventually rounded the island of New Guinea and returned to Java, having missed what afterwards proved to be the most agreeable side of the Australian continent.

It was left for the famous British navigator, *Captain Cook*, to explore this coast, which he reached in 1770 on his return from a voyage to the South Pacific, during which he had also explored the coasts of New Zealand. He landed and with his party stayed some days at Botany Bay, and afterwards coasted northward between the Great Barrier Reef and the shore. His ship was damaged by grounding on a part of the Reef, and he eventually beached the vessel for repairs on the site of Cooktown in Queensland. Rounding Cape York and passing through Torres Strait and the Arafura Sea he eventually reached Java, and finally returned to England round the Cape of Good Hope. From his observations along the south-east coast, he reported this part of Australia as being very suitable for European settlement. But in the days of sailing-ships the new country was a hazardous voyage of six months from home. So there was no rush to colonise it, and it was nearly twenty years before any settlement was made. About this time, however, the New England States of North America had ceased to be available as a place to which British convicts might be transported; and dangers and discomforts being counted of little importance as far as this traffic was concerned, the first shipload was despatched to Botany Bay in 1788 under *Captain Philip*, to whose courage and enterprise the ultimate founding of a successful British colony in Australia is due. Owing to the hostility of the natives and the unsuitability of the settlers, little progress was made at first, and the settlement was dependent upon the mother country for necessities. But difficulties were eventually overcome. Port Jackson, the magnificent harbour of modern Sydney, was chosen as a better site than Botany Bay, and eventually some free settlers were induced to take up farming in the colony. *In 1797 Governor MacArthur introduced merino sheep* from the Cape of Good Hope, and when the magnificent plains behind the Blue Mountains were discovered

in 1813, sheep rearing became the great industry of the colony, a position which it still maintains. Then followed the many explorations of the interior and the coasts, with which the names of Stuart and Eyre, Sturt and Flinders and many others are inseparably associated, and the establishment of new settlements on the sites of the modern colonial capitals of Hobart, Perth, Brisbane, Melbourne and Adelaide, each of which became in time the capital of a self-governing colony. The ultimate success of the country was assured by the rush of immigrants following the *discovery of gold at Bathurst in 1851* and later discoveries in Victoria, Queensland and West Australia; for the thousands who failed to make a fortune at the " diggings " stayed behind and helped to acquire more lasting riches for themselves and the country in the development of its many other natural resources.

Each colony developed in its own way till 1901, when it was agreed that it would be mutually beneficial if the six colonies of New South Wales, Victoria, Queensland, South Australia, Western Australia and Tasmania became federated for the management of defence, revenue, commerce and postal services, and the *Commonwealth of Australia* was proclaimed. The Government is vested in the Governor-General appointed by the King, a Senate, six members of which are elected by each State for six years, and a House of Representatives elected for three years by each State in proportion to its population. The Commonwealth Parliament will meet at Melbourne till the building of the *new capital, Canberra.* This lies about 150 miles south-west of Sydney in the Federal Territory, some 900 square miles in area, which has been acquired from New South Wales. Each State has its own Parliament for the management of internal affairs. The Northern Territory, originally part of South Australia, is now administered by the Commonwealth Government.

CHAPTER XLIV

AUSTRALIA

PHYSICAL FEATURES AND CLIMATE

The Western Plateau—The Eastern Highlands—The Central Plains—Rivers—Irrigation—Temperature and Rainfall—Climatic Regions.

THE effect of the comparative isolation of Australia from the rest of the world in postponing its development has already been referred to, and it seems highly probable that its configuration will prevent any but the regions within five hundred miles of the coast from ever being very closely settled. For its compactness, the absence of long, penetrating arms of the sea, and the high land around its margins, cause quite half of the interior to be either completely arid or at least insufficiently watered to allow of successful agriculture.

PHYSICAL FEATURES

Australia falls naturally into three fairly well-marked regions, the Western Plateau, the Eastern Highlands and the Central Plains.

1. *The Western Plateau.* This consists of vast horizontal layers of sandstone and limestone overlying more ancient granitic rocks, which in places have been exposed by the weathering of the upper strata. The plateau has a fairly uniform height of about 1000 ft. above sea-level, but where the rocks have better withstood the disintegrating action of the intense heat by day and the frosts by night experienced in this region, isolated masses rise to a height of some 2000 ft. This is seen in the projecting masses of Arnhem Land, the Kimberley and Murchison districts and the MacDonnell and Musgrave ranges of the interior. These higher regions experience a scanty rainfall and give rise to a few streams, which chiefly

end in salt swamps or become entirely lost in the desert, only a few making their way to the west coast. Much of the plateau is covered with long ridges of sand dunes formed from the disintegrated rock strata. Nothing but the prickly spinifex will grow in these regions, which, so far, seem to be economically worthless. Where the crystalline quartz rocks come to the surface, roughly along a broad belt some 400 miles from the west coast, *valuable gold deposits* have been discovered, sufficiently profitable to allow them to be worked, in spite of the desert conditions and otherwise unproductive nature of the country.

The edge of the plateau presents a steep front to the sea in most parts, especially along the shores of the Great Australian Bight, a harbourless coast of a thousand miles, with unbroken limestone cliffs 500 ft. high, the rainfall of the district being insufficient to send a single stream or river to the sea. The wetter north-west coast is more broken, but it is fringed with unhealthy tropical swamps, and, owing to the shallowing of the sea, the inlets experience exceptionally high tides. King Sound has a difference of almost 50 ft. between high and low water. Port Darwin is, however, one of the finest harbours in Australia. Except for a stretch of about a hundred miles along the middle of the west coast, where the desert reaches practically to the sea, the coastal plains bordering the Indian Ocean are suitable for grazing, and it will be shown that the south-west corner has valuable forests and farms. The *Swan River* is the only one with a constant and reliable flow suitable for navigation, and its headstreams supply drinking-water to the goldmining centres in the desert around Coolgardie, over 300 miles away. Its estuary has been improved, so as to make Fremantle the chief port of Western Australia.

2. *The Eastern Highlands.* These extend from Cape York to South Cape in Tasmania, the latter island being separated from the main mass only by the

shallow Bass Strait. Their varied rock structure indicate that they were probably produced, in the first place, by a folding and crumpling of the earth's crust, but they have suffered so much denudation from rain, rivers, frost and even ice, that the upstanding ridges have been levelled down so that the highlands are now a sort of plateau, presenting a steep face to the Pacific and sloping gently to the Central Plains. Owing to the great obstacle that they presented to the expansion of the early colonists from the coast into the interior, they were generally known as the Great Dividing Range, but the more striking portions of the eastern face are now known by various names in the different States. The highest portion is in the south, Mount Kosciusko in the Australian Alps reaching 7000 ft. The Blue Mountains behind Sydney are famous for their fine scenery and magnificent limestone caverns.

The highlands are rich in minerals, coal, gold, copper and tin being found in many parts.

The coastal slopes, receiving abundant rainfall, are well forested with useful timber, and the plateau portions known as Downs make excellent sheep-pastures.

Most of the Australian *rivers* rise in the eastern highlands, but although the *Murray*, the *Darling* and several others exceed a thousand miles in length, they are of little use for navigation. The coastal rivers are short and swift, and are impeded by falls in their upper courses and sand bars deposited where they slow down on reaching the coastal plain. They are frequently liable to floods, and many of the early settlements along the east coast, particularly those at the mouths of the Brisbane and Hawkesbury rivers, were destroyed by this cause. On the other hand, the great drawback of the long rivers that flow inland was, and still is, drought. In the dry season they often become simply streams of waterholes, and many never reach the sea.

The valleys of the eastern rivers, however, provide ;atural routes* to the plateau and the interior that re followed by the railways. The line from Sydney o Brisbane runs along the coastal plain to Newcastle, hen ascends to the plateau by the valley of the *Iunter River*, and, following the plateau northward, inally descends by the *Brisbane River*. The railways o the interior from Rockhampton and Townsville ise the valleys of the *Fitzroy* and *Burdekin* rivers.

The east coast contains a number of *good natural arbours*, and *Port Jackson* is regarded by many as he finest in the world, being deep-watered up to 'ie shores, sheltered, and accessible at all states of ie tide. Although the inlet is only some ten miles ng, owing to its winding character it has foreshores ceeding 180 miles in length. The northern half of ie coast is protected by the *Great Barrier Reef*, hich affords a smooth-water anchorage varying om 10 to 100 miles in width, although isolated oral reefs make the passage somewhat risky by ight for steamships, and at all times for sailing-iips, which are dependent upon the wind for their ourse. The Reef is about level with the surface f the ocean at low tide, and at high tide can be istinguished by the breakers. Built up by coral olyps that only live in shallow, warm and clean ilt water, the extent of the Reef is practically etermined by the 100-fathom line and the position f the tropic of Capricorn, and there are breaks in ie continuity of the Reef opposite the mouths of ie large rivers which bring much fresh water and iud into the sea at these points. This is convenient, ; it facilitates the approach of vessels from the open cean to the ports situated at the estuaries of the vers.

3. *The Central Plains.* These extend practically om the shallow Gulf of Carpentaria, which is really ily a submerged portion of the Plains in the north Encounter Bay in the south. They may be sub-

divided into the drainage areas of the *Gulf of Carpentaria* in the north, *Lake Eyre* in the centre, and the *Riverina District* in the south. The first, drained by the *Flinders* and other rivers, is a savanna country which may prove useful for stock-raising. The vegetation along the gulf shores is tropical. *Lake Eyre* lies in a depression several feet below sea-level, and in the dry season is nothing but a salt marsh, the rivers or "creeks" that feed it then being simply straggling lines of water-holes. The country round is poor scrub-land which might support a few sheep, and when the proposed Transcontinental Railway from Adelaide to Palmerston is carried across it, it may be opened up, especially if the scanty rainfall can be supplemented by artesian borings. The *Riverina District* is probably capable of great development as an agricultural country, for although the rainfall is precarious there are great possibilities of *irrigation*. The northern part of the area on the borders of New South Wales and Queensland is underlain by vast stores of underground water, which has most probably percolated through the porous strata of the well-watered Eastern Highlands. It was discovered in 1879 that if a boring were made through the surface layers of the plain, a constant stream of water could be obtained from the well. Since that time about 1000 *artesian wells* have been bored in Southern Queensland, and about half that number in New South Wales, several giving a flow of a million gallons a day. The depth of the borings varies from 200 to 4000 ft., and averages about 1700 ft. The water is quite suitable for watering stock, and surplus water has been utilised for cultivation.

By damming the upper valleys of the rivers that cross the plain it has been found possible to make large *reservoirs* of water for the irrigation of drier areas. The largest work of this kind has been carried out by the New South Wales Government at Burrinjuck on the Murrumbidgee, where a dam 200 ft.

high holds up 33,000 million cubic feet of water, which can be distributed by canals to irrigate an area of about 500 square miles at a mean distance of 150 miles lower down the river.

In the wet season the *Murray-Darling* river system provides over 4000 miles of inland navigation, but only the Murray, which is supplied by melting snows from the Australian Alps, has a good flow throughout the year. It, however, enters the sea by the shallow Lake Alexandrina, which is closed to ocean navigation by a sand-bar, and so is of comparatively little use except for small vessels. Its greatest value will probably continue to be its use in irrigating the dry but fertile areas which lie around the junction of the three south-eastern states.

The plains reach the sea in low, shelving, sandy beaches, but there are ***good harbours*** on Spencer and St. Vincent Gulfs. These are really "Rift Valleys" which have been broken across an outlying portion of the Western Plateau that extends into the regions of the Plains. The still upstanding portions form the Gawler and Flinders Ranges, the latter being very rich in copper ore. Lakes Torrens and Gairdner are salt lakes lying in the northern extension of the Rift Valleys.

CLIMATE

Temperature. The tropic of Capricorn practically bisects the continent, and the northern half is, therefore, tropical. The southern half of the continent does not reach sufficiently high latitudes to be cold in winter, and snow is unknown in the lowlands. The high southern portion of the Eastern Highlands receives, however, a good deal of snow in winter, and the sheltered corners of the highest peaks sometimes retain snow throughout the summer, supplying the Murray with water as it melts. Owing to the clear, dry atmosphere, which assists radiation, frosts are sometimes experienced at night on the plains in

the south. Except in Tasmania summer temperatures are very high, the average shade temperature for January exceeding 80° F., except in the coastal regions of the south, south-east and south-west. For not only is the sun's altitude at mid-day very great at this time in all parts of Australia, but the earth is then also nearer to the sun than at any other season, both facts making the intensity of the sun's heat a maximum. A cool current from the Antarctic slightly diminishes the temperature of the west coast, but the warm equatorial current that sweeps down the east coast has little effect at this season.

No part of the continent suffers from extremes of temperature, the range between summer and winter even in the interior at Alice Springs—one of the Overland Telegraph Stations—being only 31 degrees; at Palmerston in the north it is only 7 degrees, and at Hobart 16. This is largely due to the small difference between the length of the day in summer and winter, owing to the relatively low latitude in which the continent is situated.

Rainfall. Australia lies within the belt of the South-East Trade Winds, and as the highlands lie near to the east coast it is easily understood that the Pacific coast will receive considerable rainfall at the expense of the interior. Consequently a good third of the country receives less than 10 in. of rainfall per year, an amount quite insufficient for cultivation in a country with such high temperatures as Australia, and hardly sufficient for sheep pasturage unless it can be supplemented by further supplies of water.

The heavy rainfall of the northern coast comes chiefly in the summer months (December—February), when the high temperature and resulting low air-pressure over the centre of the continent bring about a reversal of the South-East Trade Wind, and a northwest monsoon is experienced, bringing abundant moisture from the seas to the north.

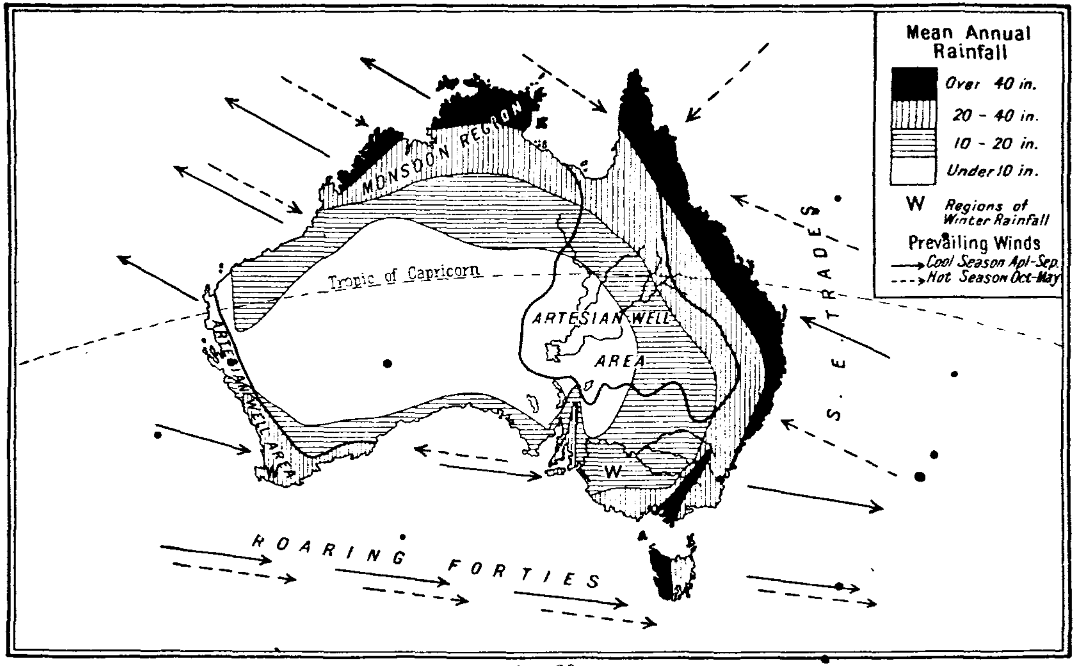

Mean Annual Rainfall
Over 40 in.
20 - 40 in.
10 - 20 in.
Under 10 in.
W Regions of Winter Rainfall
Prevailing Winds
Cool Season Apl-Sep.
Hot Season Oct-May
MONSOON REGION
Tropic of Capricorn
ARTESIAN WELL AREA
ARTESIAN WELL AREA
W
S. E. TRADES
ROARING FORTIES

Fig. 39.

The considerable rainfall of the south-west corner and of the district between Adelaide and Melbourne falls mainly in the winter months (May—August), and is brought by the cyclones of the Roaring Forties, or Brave West Winds, which blow as far north as this in that season. Tasmania (between latitudes 40° S. and 44° S.) is in the track of the Forties, and receives rain from these winds all the year round, the west side of the island being consequently wetter than the eastern.

Various parts of the continent suffer from droughts at different times, but these, fortunately, never occur over the whole country, or even over the whole of a state, at the same time; and with the improvement of irrigation and of communications, allowing the transfer of stock from stricken to more fortunate areas, the devastation frequently wrought by these droughts in the early days of the colony is now of much rarer occurrence.

Natural Regions

From considerations of temperature and rainfall, upon which natural vegetation and cultivated plants depend, it is possible to divide Australia into several fairly well-marked natural regions over which climate and vegetation are similar.

1. *The Monsoon Region of the North and North-East.* This is always hot, the mean annual temperature being 80° F. Most of the rain falls in summer, and the coastal districts receive over 60 in. per annum, being clothed in consequence with mangrove swamps. Tangled forests of *palms* and *bamboos*, with *bananas* and *valuable timber* trees, abound; and *sugar, rice, cocoa, spices* and *rubber* are cultivated. But the region is too unhealthy for Europeans, and the Government is averse to the importation of coloured labour to work on the plantations, so its development is retarded. The higher parts

of the region form park-like savannas suitable for cattle-rearing.

2. *The South-East Coasts and Highlands*, extending inland some 200 miles. These have a mean summer temperature of about 70° F. and a winter temperature of 50° F., and rainfall between 20 and 40 in. per annum. The region contains some magnificent *forests* and excellent *sheep pastures* on the tablelands or downs. The valleys produce good crops of *cereals* and *fruits*, including maize and wheat, oranges and apples.

3. *The regions of "Mediterranean Climate*," that is, with *hot, dry summers* and *mild, wet winters*. One of these regions is in the south-west between Perth and Albany, the other between Port Augusta and Melbourne. The wetter highland portions, especially in the south-west, have good *forests*, but the plains grow excellent *cereals* and *grapes*, the latter leading to a wine industry in both Western Australia and Victoria.

4. *Tasmania.* This has *a mild, moist climate* similar to Cornwall and Devon. Much of the original *forest* with which it was clothed remains, and the clearings are well adapted to *cattle pasture* and the growth of *fruit*.

5. *The dry interior, with hot summers, mild winters, and little or no rainfall.* This region practically extends to the shores of the Great Australian Bight and the middle of the west coast. Even the best parts have only a semi-desert or "scrub" vegetation, and only where there are available supplies of underground water can farming of any sort be carried on.

CHAPTER XLV

AUSTRALIA (*continued*)

INDUSTRIES AND PRODUCTIONS

Forestry—Fishing—Pastoral Industries—Agriculture.

Forestry. Much of Australia being a dry country, the forests are naturally not very extensive, and indeed are the least valuable of the natural resources of the Commonwealth, which has to import three times as much timber as it exports. The typical Australian forest tree is the *eucalyptus*, of which there are many species, the Blue Gum almost equalling the famous Douglas Pine of North America in bulk. It flourishes on the Eastern Highlands in New South Wales and Victoria. The most valuable species commercially is, however, the *jarrah*, of which there are extensive forests in Western Australia on the highlands between Perth and Albany. It is a fine, hard wood, practically imperishable in water, and resists the attacks of ants and worms. This makes it in great demand for building piers and jetties, and it is also largely used for railway sleepers. The *karri* tree, grown in the same district, is used for making the hard red wood-blocks for street paving.

Ebony, mahogany and other furniture woods are found in the tropical forests of Queensland and the Northern Territory.

One species of eucalyptus produces a valuable medicinal oil, and the acacia, or *wattle*, which is very common in most parts of Australia, provides bark for tanning.

Fishing. The rivers of South-East Australia abound in edible fish, as do also the shallow inshore waters, but very few people take part in the fisheries, and at present there is no export of the ordinary kinds

of fish. There is a good deal of successful *oyster* fishing in the inlets of New South Wales to supply the home market.

On the Barrier Reef and along the tropical northern coasts Malay and Chinese fishermen catch the *trepang*, or sea-cucumber, also called bêche-de-mer. These are dried and exported to China, where they are considered a delicacy.

Diving for *pearl-oysters* is carried on in Torres Strait and Shark Bay on the north-west coast. From some of the shells pearls are obtained; others yield mother-of-pearl, which is the lining of the shell.

Jervis Bay, on the coast of New South Wales, has a whaling fleet, the *whales* being caught in the neighbourhood. The most valuable product of this fishery is the whale-oil, which is used in soap-boiling, but an inferior sort of whalebone is also derived from some of the several species caught. The sperm whale, which yields an oil from which spermaceti, used in making ointments and candles, is obtained, is rare in these parts.

Another curious fishery of New South Wales consists in chasing with a motor launch and harpooning a kind of *dolphin*, or porpoise. The teeth are used for coinage in some of the South Pacific islands, and are worth about ten shillings a hundred.

Pastoral Industries. These are by far the most valuable industries of Australia, and account for over half of the total exports.

Sheep are by far the most numerous animals reared, Australia having more of these animals than any other country in the world. In 1912 the number exceeded 83 million, of which about half were in New South Wales and a quarter in Queensland. For its size, too, Victoria is an extensive sheep-rearing colony, and its flocks produce fine wool. The scrub-lands of South and Western Australia also support considerable numbers. Most of the sheep are of the famous Spanish Merino breed,

which were first introduced into New South Wales from Cape Colony in 1797. The climate and pastures of Australia so improved the texture and weight of the fleeces of these animals that *Australian wool* soon became famous as the *finest in the world.* A road having been found across the Blue Mountains in 1813, opening up the grassy western slopes of the Eastern Highlands and the river plains beyond, the industry spread rapidly both to north and south, and, in spite of the periodical droughts which killed off whole flocks in some districts, continued to thrive. The effect of these droughts is now modified by obtaining supplies of water from artesian wells and other methods of irrigation (see p. 304), by driving herds along well-marked stock routes to better pastures under Government protection, by transferring stock by railways where these are available, and by subdividing the larger flocks. Even now a few flocks number more than 100,000 sheep each, and there are hundreds exceeding 10,000 in number. The larger herds are kept in "runs" which are often several square miles in area, and are tended by shepherds who make their rounds on horseback. The smaller herds are enclosed in "paddocks." Winter housing is unnecessary. Sheep in Australia are singularly free from disease, the greatest enemies of the flocks being the dingo, or native wild dog, and other dogs and foxes, which kill and devour large numbers of lambs. Rabbits and wallabies, which eat up the pasture, are also a source of great trouble to the sheep farmers. There are nearly 100,000 miles of rabbit-proof fencing in New South Wales alone, and rewards are paid for the destruction of the pests. An industry has recently sprung up in exporting the frozen carcasses of hares and rabbits, and also the skins, which are used in making furs and felt.

Before refrigerating machinery had been invented and installed on ocean-going liners the wool was practically the only exportable product of the sheep,

although some carcasses were boiled down for the tallow which could be used in the making of soap and candles. But now there is a considerable and increasing trade in *frozen mutton*, some breeders selecting their sheep with this end in view. Even yet, however, the value of the wool exported is ten times as great as that of all the other products of the sheep. Practically the whole of the mutton goes to the United Kingdom, and nearly half the wool, the rest finding a large market in the countries of Western Europe through the ports of Antwerp, Hamburg and Havre, and in India and Japan.

Cattle-rearing is carried on in the moister coastal regions and on the plateau, where pasture is richer than on the downs and plains lying further to the west. Queensland, with over five million, has about half the cattle in the colony, and New South Wales a quarter. The Gippsland region of Victoria to the east of Melbourne is famous for its dairy farms. In Queensland larger breeds of cattle are kept for the preparation of *tinned and frozen beef* for export, but in the other states more attention is given to dairy cattle, and the export of *butter* is rapidly increasing in value. Australia specialises in butter rather than cheese, because the latter is more bulky and less valuable, which is an important consideration when freight for a 12,000 miles' voyage has to be paid; and also cheese is adversely affected by refrigeration, while butter is not.

The export of *hides* is also valuable in connection with this industry.

Horses are reared for home use and for export, especially to India, those of New South Wales, which have been derived from Arab stock, being famous. Queensland and Victoria also rear large numbers.

Pigs are also reared in considerable numbers in the three eastern states, and there is a small but increasing export of bacon and hams. They are kept mainly in the dairy-farming districts, the milk

from which the cream has been separated being a cheap and valuable food. Maize and other food crops for the animals can also be easily grown in the same districts.

Camels, originally introduced from Afghanistan, are reared in Western Australia, South Australia and the western plains of New South Wales for use as transport animals in the drier districts, particularly in the service of the Transcontinental Telegraph Stations between Adelaide and Palmerston.

Ostrich-farming is being taken up on the plains of New South Wales.

Agriculture. Of the three million square miles covered by Australia only some 20,000 are at present cultivated, but this area is steadily increasing, and agricultural productions are gradually approaching the pastoral in value. Much land quite suitable for agriculture if properly worked is, however, still occupied by large sheep runs. Other hindrances to the development of this industry are the scanty and precarious rainfall over large areas of the interior, and the fact that, where the rainfall is sufficient, the land has to be cleared of scrub or trees before it can be ploughed or sown. There are no parts of Australia quite like the Canadian prairies. The first difficulty is being overcome by the boring of *artesian wells* and the construction of irrigation works, as described in an earlier chapter. *Irrigation from the rivers* seems to be the best method from the agricultural point of view, as although the artesian well water is quite suitable for sheep and cattle, it is too alkaline for crops. This is especially the case in Western Australia. Experiments have, however, shown that the alkali can be neutralised by the use of nitric acid, which converts it into a fertiliser. Special methods of preparing the ground, known as "*dry-farming,*" learnt from farmers in the drier districts of the western United States, and modified to suit local conditions after practical research work in the ex-

perimental farms and agricultural colleges of the Commonwealth, are also being successfully applied. The *clearing of the forest areas* is affected either by felling the timber, if it can be marketed, or else by " ring-barking " the trees and burning them off after they are dead. Although the latter method appears wasteful and gives a desolate appearance to the cleared " bush." country, the wood-ash is a valuable manure, and the area soon becomes covered with rich grass. After a time the smaller tree-stumps become loose, and can be removed quite easily. The scrub-lands, which are covered with shrubs of the eucalyptus or acacia species, the " mallee " of North-West Victoria being fairly typical, are cleared by crushing the scrub by means of a heavy roller, or uprooting with the help of a traction-engine, and finally burning off the refuse.

Wheat is by far the most valuable and widely cultivated crop, occupying about half of the total cultivated area. New South Wales, Victoria and South Australia have each about two million acres under wheat, and there are almost a million acres of wheat-land behind Perth in Western Australia. In the artesian well area of Queensland the industry is being taken up, but this state pays more attention to sub-tropical and tropical produce. In all the regions mentioned, the hot, dry summer conditions are ideal for ripening off the crop. The Riverina District, the country around Spencer and St. Vincent Gulfs, and the plains along the Lower Murray, especially in the irrigated settlements around Renmark, Mildura and Wentworth, are highly favoured on this account and also by the richness of the soil. Wheat-growing is gradually being abandoned in the moister and fertile river valleys of the east coast owing to the prevalence of " rust." A really profitable crop cannot be grown where the mean annual rainfall falls short of 15 in. unless the amount can be supplemented by irrigation, although it is stated that

10 in. of rain has sufficed where this has fallen in the growing season.

The average production of an acre of wheat-land in Australia is only about 11 bushels, which would seem to compare very unfavourably with the 33 of the mother country, or even the 21 of Canada. This is no doubt partly due to insufficient rainfall, but more to the less intense methods of cultivation, and in many cases to the lack of knowledge and experience in the farmers. This is, of course, not really so important in a country, like Australia, where land is so much cheaper than in England. The quality of the grain is, however, excellent, and realises in the London market prices equal to those of the best Canadian qualities.

Australia now grows far more wheat than is necessary for her own needs, and according to the state of the harvest exports greater or less quantities to the mother country. January is the harvest month, and Australian supplies consequently reach this country at a time when those from Canada, the United States, Russia and the home fields are becoming exhausted. Wheat ranks next to wool and gold in the value of the exports of the Commonwealth.

The " elevator " system in vogue in North America has not yet been established in Australia, and the grain is principally exported in sacks. Experiments are, however, being made with storage elevators and shipment of the grain in bulk at Port Adelaide. The greatest drawback to this method was the unwillingness of insurance companies to cover risks of sending wheat in bulk by the large sailing-ships which used to make the long voyage home by Cape Horn, but with the substitution of modern steamships for the old sailing-vessels, this objection has practically disappeared. The new method would also entail the construction of grain cars to deal with the traffic on the railways, as those used to convey live-stock and wool are totally unsuitable for conveying grain

in bulk. The advantage which Australia possesses over Canada in the greater nearness of the wheat-fields to the seaports is counteracted by the longer sea-voyage entailing higher freights and insurance.

Hay, to provide extra food for sheep, cattle and horses, is cultivated over large areas in all the States. For this purpose wheat, oats and barley are largely planted, the crop being reaped just before it begins to turn yellow and while the grain is soft. *Lucerne*, a sort of clover, is also very valuable. The native grasses of Australia, unlike those of the Canadian prairie or the South American pampas, are very poor, providing no natural hay, as they die right off at the end of the summer.

Oats, Barley and Potatoes are cultivated over considerable areas in all the States.

Maize is grown in the hotter and wetter river valleys of southern Queensland and northern New South Wales. In northern Queensland two crops can be grown in the year, and the corn is the principal food of the horses reared in the State.

Sugar Cane is cultivated to an increasing extent each year in the coastal districts of Queensland and the warmer parts of New South Wales, the yield being greatest in the hotter and wetter northern districts, especially around Mackay, Bundaberg and Cairns. Even in these districts it has been found that the yield of sugar per acre of land planted can be quadrupled by irrigating the plantations from reservoirs formed by damming the streams and rivers. The large estates were formerly worked by European planters assisted by Kanaka labourers. These natives from the Pacific Islands were accustomed to the hot, moist climate which is so trying to the white man, especially with the laborious work entailed in cutting and gathering the canes in the fields and in crushing them in the mills. Coloured labour is now excluded by a "dictation test," and financial assistance is given by the Government to encourage planters to employ white labour. This

has resulted in the breaking up of the large estates into smaller ones, each worked by a poorer white farmer and the members of his family. The canes are crushed in central mills established by the Government.

Vineyards have been planted on large areas in Victoria and South Australia, and to a smaller extent in Western Australia, New South Wales and Queensland. They flourish best in those regions where the climate is of the Mediterranean type, the long roots of the plants enabling the vines to withstand the summer droughts. The best grapes are produced on the volcanic soils in the valleys of Victoria and South Australia, several districts along the Murray and its southern tributaries, notably Mildura, Rutherglen and the Goulburn Valley being famous. About half the grapes are used in making wine, and there is considerable export to Great Britain from the three Southern States, but the development of this industry is hindered by the lack of experience of the growers and the prejudice in favour of the well-known wines of Southern Europe. The heavier wines are made from the grapes grown on the hotter lowlands, those grown on the highlands being used for lighter wines and for table purposes or to be dried for raisins.

Oranges and lemons are cultivated in the coastal valleys of Queensland and New South Wales, the Paramatta and Hawkesbury River districts near Sydney being famous. The coastal district of South-West Australia is also capable of producing large quantities of these fruits.

Pears, apricots, plums and peaches thrive in all the Southern States, and there is an increasing trade in the export of dried and tinned fruits.

Apples are largely grown for export in the forest clearings of Southern Tasmania, where the climate is very similar to that of the fruit countries of Southern Britain.

Bananas are grown in large quantities for export

along the hot, wet Queensland coast, especially around Cairns, Maryborough and Brisbane.

Rice in the lowlands and *coffee* on the hill slopes are cultivated, but only to a small extent in the tropical regions of the north, where there are also possibilities of the cultivation of rubber and cotton. The great drawback to the development of these regions is, however, the objection to coloured labour. Increasing knowledge of tropical diseases and medicine may in time open them up for white settlement, or it may be considered whether it would not be worth while to encourage immigration from other parts of the Empire, such as India, which have a dense population accustomed to tropical conditions. Otherwise, in view of the large and crowded populations of the river valleys and coastal plains and islands of eastern Asia, these large, productive and undeveloped regions may become a source of weakness to the Commonwealth and the Empire.

CHAPTER XLVI

AUSTRALIA (*continued*)

INDUSTRIES AND PRODUCTIONS (*contd.*)

Mining and Manufacturing.

Mining. Australia has enormous mineral wealth, especially in the ancient rocks of the Eastern Highlands and parts of the Western Plateau. Except for the gold, this has, so far, not been extensively developed, and the output of the mines is at present of less value than the products of either the pastoral or agricultural industries.

But the comparatively rapid development of Australia from an out-of-the-way convict settlement to a thriving self-governing Commonwealth in the

last half century has been largely due to the discovery of gold in various parts, commencing at Bathurst in 1851. For the thousands of unsuccessful gold-seekers who rushed to the diggings and were too poor to return to their homes across the seas, stayed to develop the more permanent resources of the pastures, cornfields and orchards; and demonstrated that Australia offered to hard workers a certain livelihood under more congenial conditions than were to be found in many other parts of the world.

Gold. As in most countries, gold "nuggets" were first picked up along ancient or existing stream courses, having been washed out of quartz rock by the action of the running water. Such alluvial deposits are still worked along many rivers of the country, and in others "dredging" is carried on in order to examine the deposits at the bottom of the rivers. But most of the gold is now obtained by boring into the gold-bearing quartz, the shaft in some mines being as much as 4000 ft. deep. Dynamite is used in blasting out the rock, which is very hard. It is then crushed by heavy and expensive machinery, and the gold is finally separated from the quartz by the help of mercury and by washing with water.

Western Australia, with over half the total annual production of the country, is now the greatest gold producer, the discoveries having been made later there than in the other colonies, owing to the desert conditions. The richest field is in the *Coolgardie District,* where *Kalgoorlie* is the largest town. In the early days water was almost as valuable as the gold, but now a regular supply has been laid on from reservoirs on the Swan River over 300 miles away. Other rich fields are at *Mount Margaret,* 150 miles north-east of Coolgardie, and in the *Murchison District,* some 250 miles inland from Geraldton. There are smaller deposits further north.

Victoria, where some of the earliest discoveries were made at *Ballarat* and *Bendigo,* has produced a

greater quantity than any other State, and still stands second in the value of its annual output, which is, however, showing a steady decline. The places named, especially the latter, are still important centres, and there are many others on both flanks of the Great Dividing Range.

Queensland ranks next as a gold producer, its most valuable fields being at *Mount Morgan*, *Charters Towers*, and *Gympie*.

In New South Wales gold is still mined near *Bathurst*, but the richest yields now come from *Cobar* and *Mudgee*.

Tasmania has a rich gold-field in the north near *Beaconsfield* on the Tamar estuary, but South Australia and the Northern Territory have only very small deposits.

Silver, lead and *zinc*, which are usually found together, are next in point of value. By far the most important mining area is on the western border of New South Wales, where *Broken Hill* and *Silverton* are the chief centres of a mining district covering 2500 square miles. Silver is also mined at several points in the Great Dividing Range in Queensland, and also in the west of Tasmania behind Macquarie Harbour.

Coal measures crop out at many points on the Pacific Slope of the Eastern Highlands, their proximity to the sea being of great advantage to the country. The largest and richest area is in New South Wales, and extends roughly 100 miles north and south and west of Sydney, the greatest output being from the *Hunter Valley* and *Newcastle* mines. The best steam coal comes from the southern and western districts around *Illawarra* and *Lithgow*, that from the latter being particularly good also for smelting. Coal-cutting machines, driven by electricity or compressed air, are largely used, and many of the workings, especially in the Lithgow district, are only tunnels into the hillside. The total output of this field

exceeded 10 million tons in 1918, about a third being consumed in New South Wales, a third sent to other States of the Commonwealth, and the remainder exported chiefly to Chile, New Zealand, the western United States, the Philippine Islands and the Malay Peninsula and Islands. The Government have constructed harbour works at Port Kembla, 50 miles south of Sydney, to deal with the export of steam coal, which should greatly increase.

In Queensland the chief coal-mining districts are at *Ipswich*, *Maryborough* and *Rockhampton*.

The Victorian Government have established a State colliery and mining colony at *Wonthaggi*, about 80 miles south-east of Melbourne, in the Gippsland District, where there are also several smaller mining centres.

In Western Australia there are coal-mines along the Collie River, 40 miles inland from *Bunbury*, a port about 100 miles south of Perth. This is useful in connection with ships calling at Fremantle and Albany.

In Tasmania coal is mined at *Fingal* and several other points along the east coast.

Copper. The largest quantities of this metal used to be obtained from the Mount Lofty and Flinders Ranges in South Australia, and there are still valuable mines and smelting works at *Wallaroo* and *Moonta* on Spencer Gulf. But Queensland is now the chief producer of this metal, the largest quantities coming from *Mount Morgan*, *Cloncurry* and *Rockhampton*. It is also found associated with gold in the *Pilbara* goldfields of north-west Western Australia, and at *Mount Lyell* in Western Tasmania. In New South Wales the chief copper-mines are at *Cobar*.

Tin is obtained by mining and also by dredging the river-beds, mainly on the borders of Queensland and New South Wales, where *Stanthorpe* and *Inverell* are important centres. The *Cairns* and *Cooktown* districts of Queensland are also important, and there are very

valuable mines in Northern Tasmania, notably at Mount Bischoff.

Iron Ore probably exists in large quantities, but, as manufacturing is not yet well developed, it is, so far, little mined. The chief iron mining and smelting district is in New South Wales on the coal-field near Lithgow.

There is no lack of good *building stones* in all parts of Australia, and small quantities of the rarer minerals, such as *wolfram* and *bismuth*, and precious stones, such as *diamonds* and *opals*, are worked in the Eastern Highlands.

Manufactures

Australia is still mainly concerned with the development of its natural resources and the exportation of the produce of its fields, mines and forests; relying on older established countries for most of its manufactured goods. But in the older and larger seaports, many manufacturing industries are now growing up. Indeed, the value of the products of these manufactures exceeds that of any other single industry, and about 7 per cent. of the total population of the Commonwealth are engaged in factories.

Textile and clothing factories employ the largest numbers, and after them come various metal and machine industries. The preparation of foodstuffs, such as *flour-milling*, *sugar-refining*, the *making of butter*, *cheese* and *wine*, *canning of meat and fruit* constitutes another important group. *Saw-milling* and various wood industries are important in the forest areas and the *making of furniture* in the larger towns. *Soap-boiling*, *candle-making* and *leather industries* are important in the towns near the cattle-rearing districts, which supply the tallow and hides, the tanning material for the last-named being obtained from the locally grown wattle-bark.

CHAPTER XLVII

AUSTRALIA (*continued*)

COMMUNICATIONS AND COMMERCE

Rivers—Railways of the different States—Transcontinental Lines —Telegraphs and Cables—Commerce—Seaports and Shipping Routes.

Owing to the unproductive nature of the greater part of the interior of Australia, the settlements have been confined mainly to the coastal strip, and are only in quite recent years beginning to expand even into the Great Plains of the south-east, where various means of irrigation are overcoming the hindrance to settlement occasioned by a scarcity of rainfall. Otherwise it is only where there are valuable mineral deposits, able to bear the cost of transport of food and water for those engaged in developing them, that settlements have been founded in the dry interior districts.

Owing to the scanty population of the continent, the local market for the products of farms and mines was almost negligible, and they could not be profitably worked unless there were facilities for conveying the produce to the seaports in order to reach the markets overseas.

Rivers. It has been shown that Australia is singularly deficient in natural means of communication, the rivers being either short and swift and liable to floods or else, where they are longer and slower, subject to droughts, which render them unnavigable in certain seasons. Even the Murray, which is kept fairly well supplied with water throughout the year by the heavy rainfall and melting snows of the Australian Alps, has its great drawback, for it enters the sea by the shallow lagoon, Lake Alexandrina, which has the further disadvantage of a sand-bar across its entrance.

Thus even the longer rivers are only useful for small boats which serve to convey cargoes of wool, wheat, etc., to the nearest railway station on the banks. As, however, the rivers have great value for purposes of irrigation, their small value for navigation will perhaps allow of greater use being made of their water in the former manner.

Railways. This lack of natural means of communication gives great importance to the railways. It will be seen from a railway map that most of the lines are simply short routes from a seaport to a mining or farming centre in the interior, and there is very little linking up of the lines, except in the more thickly peopled south-east corner. Victoria is best provided with railways, having one mile of line to each 24 square miles of territory, the proportions in the other States being Tasmania 52, New South Wales 79, Queensland 150, South Australia 173 and Western Australia 350. A great drawback to the railways of Australia is that, having been constructed before the federation of the States, each State built its own railways without reference to the other States, and consequently there are three different gauges in common use. New South Wales has the ordinary English 4 ft. 8½ in., Victoria has 5 ft. 3 in., while most of the lines in the other States are 3 ft. 6 in. This makes it impossible to pass by rail from one State to the next without changing at the frontier. The great disadvantage of this is seen when it is remembered that the most important traffic is in goods and livestock, which makes interchanging costly in time and money. It would also be a serious obstacle to the rapid transmission of troops, horses and munitions of war should that ever be necessary. Consequently the Government are taking in hand the gradual conversion of all the railways to the 4 ft. 8½ in. gauge, and the new *Transcontinental Railways* from *Perth to Adelaide* and from *Adelaide to Palmerston* will also be of the same type, so that in a few years it will be

possible to travel easily between all the settled parts of the country.

Railway construction across the Eastern Highlands has been fairly difficult, and they have not yet been pierced anywhere between Melbourne and Sydney, the greater part of the route between these two cities being behind the mountains. It is interesting to note also that the line from Sydney to Brisbane, having ascended the plateau by means of the Hunter Valley, keeps along the high level till it descends again to the coast by the Brisbane River. The following routes should be noted—

QUEENSLAND. 1. From *Cairns* through sugar and banana plantations to the mineral districts of the highlands and the cattle pastures beyond. This line will probably be extended to the Flinders River and Gulf of Carpentaria through a rich pasture land and gold-mining district.

2. From *Townsville* to the gold-mining centre of *Charters Towers* and the cattle and horse farms of *Hughenden* and *Cloncurry*.

3. From *Rockhampton* to the rich *Mount Morgan* gold-mine, the rich cattle pastures of the Fitzroy river and its tributaries, and the sheep pastures of the plateau and western plains. It extends to *Longreach* on the head-streams of Cooper's Creek.

4. From *Brisbane*, the capital, (*a*) along the coast through plantations of maize, sugar and fruits, rich cattle pastures and the *Gympie* gold-mining district to *Maryborough*, *Bundaberg* and *Rockhampton*; (*b*) inland through the well-timbered lumbering districts on the eastern slopes, the coal-mining region around *Ipswich*, the wheat-fields and vineyards of *Roma*, to the sheep farms of *Charleville* and *Cunnamulla* in the artesian well area; (*c*) through the fertile agricultural districts of *Toowoomba* and *Warwick* to the famous pastures of the *Darling Downs*, with their delightful climate and the tin-mines of *Stanthorpe*.

NEW SOUTH WALES. 1. From *Newcastle* (*a*) as-

cending the Hunter Valley through the richest coal-mining area in Australia and the fertile and productive farming region around *Maitland* to the Liverpool Plains, where the fertile volcanic soil and sufficient rainfall have established the rich mixed farming area around *Tamworth.* The line continues across the highlands through the tin- and gold-mining centres and sheep farms of *Armidale* and *Tenterfield* to the Queensland border. Branches lead off to irrigated farms in the artesian well area of the western plains. (*b*) Northward, along the coastal plain, through well-timbered districts, with dairy farms, fields of maize and vineyards, to *Port Macquarie.* This line will gradually be carried further northward towards *Grafton* and the border.

2. From *Sydney,* the capital, (*a*) along the coast to *Newcastle,* (*b*) through the orange groves and orchards of *Paramatta* and the magnificent scenery of the Blue Mountains, to the coal-mining district around *Lithgow* and the sheep farms, agricultural country and gold-mines of *Bathurst.* The line then continues by the irrigated farms of *Dubbo* to *Bourke,* on the Darling, the collecting centre of wool by means of river and camel transport from the sheep farms for many miles around. A branch runs to the copper- and gold-mines of *Cobar,* and another to the farms of the Lachlan River; (*c*) through the rich agricultural and pastoral districts of *Goulburn, Cootamundra* and *Wagga Wagga* to the vineyards of *Albury* on the Murray, where a bridge leads into Victoria. The break of gauge at this point increases the importance of this junction. Branches run from this line to *Canberra,* the site of the new Federal Capital, and also through the area along the Murrumbidgee, irrigated by the Burrinjuck Scheme (see p. 304), to *Hay,* a sheep-rearing centre; (*d*) along the coast southward through the chief dairy-farming districts of the State and the coal-mining and exporting centres of *Wollongong* and *Port Kembla.*

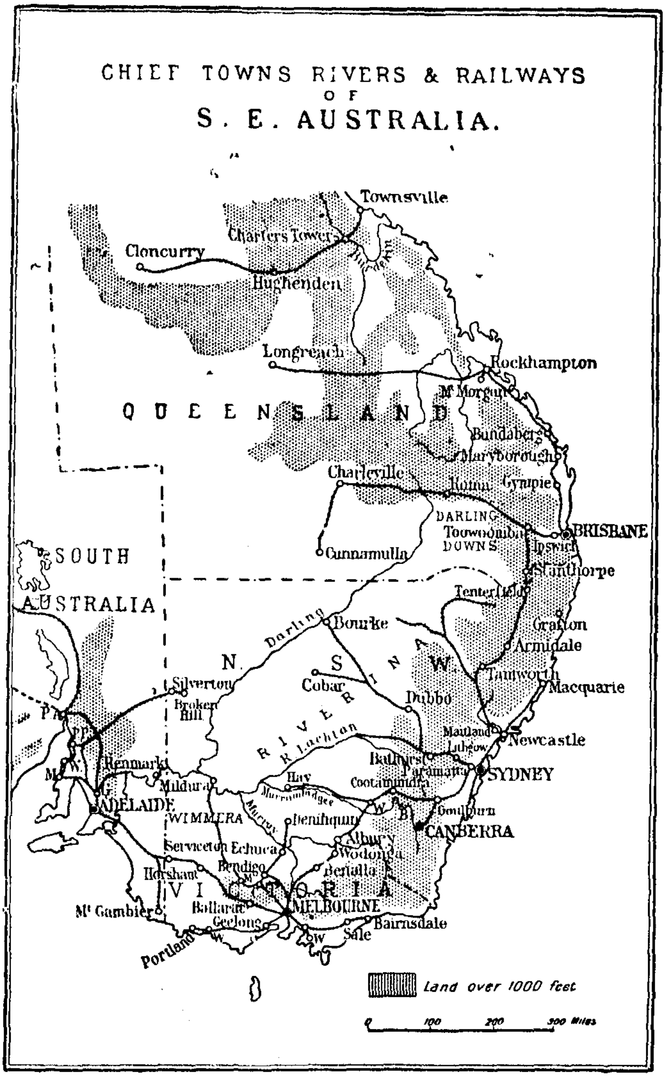

CHIEF TOWNS RIVERS & RAILWAYS OF S. E. AUSTRALIA.
Townsville
Charters Towers
Cloncurry
Hughenden
Longreach
Rockhampton
Mt Morgan
QUEENSLAND
Bundaberg
Maryborough
Charleville
Roma
Gympie
DARLING DOWNS
Toowoomba
BRISBANE
Ipswich
Cunnamulla
Stanthorpe
SOUTH AUSTRALIA
Tenterfield
Darling
Bourke
Grafton
Armidale
N. S. W.
Cobar
Tamworth
Macquarie
Silverton
Broken Hill
Dubbo
RIVERINA
R. Lachlan
Maitland
Newcastle
Lithgow
Bathurst
Paramatta
SYDNEY
Renmark
Mildura
Hay
Cootamundra
ADELAIDE
Murrumbidgee
Goulburn
WIMMERA
Murray
Deniliquin
CANBERRA
Serviceton
Echuca
Albury
Wodonga
Horsham
Bendigo
Benalla
VICTORIA
MELBOURNE
Mt Gambier
Ballarat
Geelong
Bairnsdale
Sale
Portland
Land over 1000 feet
0 100 200 300 Miles

Fig. 40.

VICTORIA. In this State the railways radiate in all directions from *Melbourne.* The following should be noted—

1. Eastward through Gippsland, a heavily timbered region which, when cleared, makes very rich pasture land, owing to the heavy rainfall. *Maffra, Sale* and *Bairnsdale* are famous for dairy farming and butter-making. Good crops of cereals, fruit and flax are grown, and there is a variety of mineral wealth with a State colliery at *Wonthaggi.*

2. North-eastward across the Great Dividing Range to the fertile irrigated lands of the Goulburn tributary of the Murray, growing excellent wheat and grapes for wine, and across well-stocked sheep and cattle farms around *Benalla* to the Murray at *Wodonga* opposite *Albury.*

3. Northward, through *Bendigo,* the chief gold-mining centre of the State and the centre of a rich agricultural area, to *Echuca* and other irrigated districts along the Murray. Echuca is connected by rail with *Deniliquin,* a farming centre of the Riverina District of New South Wales.

4. North-westward through the gold-mining centres of *Castlemaine* and *Maryborough,* and across the *Mallee* scrub districts, which have been cleared for wheat-growing, and the stock-raising *Wimmera* district to *Mildura,* the irrigation settlement on the lower Murray, which has the most extensive vineyards in the State and dries large quantities of raisins and currants for export.

5. Westward, through *Ballarat,* a still famous gold-mining centre, and *Horsham,* the chief centre of the irrigated wheat and wool farms of the Wimmera district, to *Serviceton* on the South Australian border.

6. South-westward to *Geelong,* a great wool port with some woollen mills, and the agricultural and dairy-farming districts of *Warrnambool* and *Portland.*

SOUTH AUSTRALIA. 1. From *Adelaide* (*a*) to the

south-east, through pastoral country to *Serviceton* and the rich agricultural and fruit-growing district of *Mount Gambier*. (*b*) North-eastward to the manufacturing town of *Gawler*, and across the Flinders Range to the Murray near the Irrigation Settlement of *Renmark*. (*c*) Northward across the arable valleys and pastoral highlands of the Flinders Range to *Port Augusta*, a wheat port, and then on through the more arid scrublands of the interior to *Oodnadatta*. This may one day be linked with the line from *Palmerston* to *Pine Creek* in the Northern Territory.

2. From *Port Pirie* (*a*) to the silver, lead and zinc mines of *Silverton* and *Broken Hill* in New South Wales; (*b*) to *Wallaroo* and *Moonta*, copper-mining and smelting centres.

3. From *Port Augusta* a *trans-Continental Railway* is in course of construction to *Kalgoorlie* in Western Australia.

WESTERN AUSTRALIA. 1. From *Perth* (*a*) up the Swan River, with its *wheat-fields* and vineyards, through scrub-lands affording pasture to sheep, to the rich gold-mines of *Coolgardie*, *Kalgoorlie* and *Mount Margaret*; (*b*) southward to *Bunbury*, the port for the jarrah forests and the Collie coal-field and *Busselton*, the centre and seaport of a rich agricultural and lumbering district; (*c*) through the jarrah forests and clearings to *Albany*, the best natural harbour in the State; (*d*) northward, through a district suitable for the growth of wheat and Mediterranean fruits, to *Geraldton*.

2. From *Geraldton* through wheat and sheep-farming districts to the Murchison gold-fields at *Mount Magnet*, *Cue* and *Nannine*.

TASMANIA. From *Hobart* the line runs through orchards and forests to *Launceston* and then by the north coast to the tin-mines of *Mount Bischoff* and southward to *Mount Lyell* and *Macquarie*.

Camels, introduced with their drivers from Afghanistan, are used for transport in the drier districts

of Western Australia, South Australia and New South Wales.

TELEGRAPHS. Overland telegraphs connect Adelaide with Port Darwin and with Perth. From the former there is cable communication with the mother country, via Java, Singapore, Madras, Bombay, Aden, Suez, Port Said, Malta and Gibraltar, and from the latter via Cocos Islands, Colombo, Aden, etc. Another cable runs via Brisbane, Norfolk, Fiji and Fanning Island to Vancouver. There are also twenty Wireless Stations round the coast.

COMMERCE AND SEAPORTS

The *overseas trade of the Commonwealth* shows a steady increase from year to year, and in the last ten years the total exports of all the States have increased by half, while the total imports have doubled in value. The mother country is still by far the best customer of Australia, taking over 40 per cent. of her exports; and, in return, the colony receives about 60 per cent. of her imports from the United Kingdom. These proportions, however, show a tendency to diminish, as in recent years direct trade has been opened up between Australia and the principal foreign countries, particularly France, Germany and Belgium. Twenty years ago these countries bought any Australian produce they required in London.

Wool has always been, and still is, the chief export of Australia: in 1912 it accounted for more than a third of the total exports, New South Wales, Victoria and Queensland being the greatest exporters. Not only is the intrinsic value of this staple very great, but it has had an important influence in developing the shipping of the Empire. Large ships were built to bring this valuable and bulky cargo across the 11,000 odd miles intervening between the east coast ports and the mother country, and further trade followed as a natural result. At first London was

practically the only market for Australian wool, but the establishment of wool markets in the great Australian capitals and the advent of large foreign shipping lines have made Hamburg, Antwerp and Dunkirk the direct destination of many shiploads of this commodity, at the expense of the London wool trade.

Gold is the next export in point of value, Australia ranking after South Africa and the United States as a producer of this metal. There are mints at Melbourne, Sydney and Perth, and most of the gold leaves the country in the form of specie.

Wheat and flour are important exports from South Australia, New South Wales and Victoria, and show a steady increase in value, in spite of fluctuations due to droughts.

Animal products such as hides, butter, frozen meat and tallow, and *minerals* such as copper, zinc, tin and silver, are exported in considerable quantities, mainly to the United Kingdom and the countries of Western Europe, while *timber* and *coal* are exported to nearer countries.

Of the *imports* nearly 20 per cent. consist of *textiles and clothing*, and about 15 per cent. of *manufactured metal goods* and *machinery*. These are chiefly obtained from the United Kingdom, but the United States and Germany also compete with the mother country. Other imports are *timber* from British Columbia and New Zealand, *tea* from Ceylon, *sugar* from Fiji and other islands of the Pacific and Indian Ocean, and *jute sacks* from India.

Considering the small population of the continent, the total trade carried on is very large, amounting to about £25 per head per annum. This is probably because, although the country might easily become self-supporting, the colonists prefer farming to manufacturing industry, and therefore obtain most of the manufactured articles and luxuries they require from foreign countries in exchange for their surplus pro-

ducts. For this reason good seaports and railway connection with the productive centres of the interior are quite essential to the life of the country, and it will be noticed that all the State capitals are seaports.

New South Wales has the largest share in the commerce of the Commonwealth, accounting for over 40 per cent. of the total.

Sydney is the busiest seaport in the colony. Its harbour, Port Jackson, is one of the finest in the world, being capacious and sheltered, having sufficient depth of water at all states of the tide for the largest shipping, and being easily defensible and accessible from its very productive hinderland (see Railways, p. 327). Good wharves and storage sheds have also been constructed, and separate berths are arranged for ships engaged in local, inter-State and overseas trade. The city is situated about four miles from the entrance. Over 8 million tons of shipping entered the harbour in 1912. Other ports of New South Wales are *Newcastle*, *Wollongong* and *Kembla*, mainly used in connection with the coal trade, and *Jervis Bay*, which is to be the seaport of the new Federal Capital.

Victoria is responsible for nearly 30 per cent. of the total trade.

Melbourne, its capital, ranks second only to Sydney as a seaport. Port Philip forms a large and safe anchorage, but its entrance is narrow and shallow. Ships of 8000 tons ascend the River Yarra to the city, but the largest ocean liners anchor at Port Melbourne at the mouth of the river. The many railways that converge upon it (see p. 329) bring in wool, wheat, butter, meat, hides, gold and wine for export, and some six million tons of shipping entered the port in 1912. *Geelong*, also on Port Philip, has considerable wool trade, and *Warrnambool* and *Portland* export dairy produce.

South Australia and Queensland have each about 10 per cent. of the total trade, and their capitals are the third and fourth seaports of the Commonwealth.

Adelaide, on the Torrens River, about seven miles from Port Adelaide on St. Vincent Gulf, is important as the place at which the mails to and from Europe are collected from and received for all the eastern States. It is the chief wheat port, and also exports large quantities of wool. *Port Augusta* and *Port Pirie* are also wheat ports, and the latter exports the silver, zinc and lead from Broken Hill. *Moonta* is a great port for copper.

Brisbane is situated at the mouth of the Brisbane River, which is very liable to floods, and the harbour needs constant dredging. These facts and the existence of a number of other ports, each connected by rail with its immediate hinderland, tend to diminish its importance, but the fertile and productive Darling Downs and the rich mineral wealth of the highlands provide valuable exports of wool, frozen meat, copper and tin.

Fremantle, the port of Perth, the capital of Western Australia, stands fifth in the point of tonnage of shipping entering the ports. Its harbour, at the mouth of the Swan River, has been improved, and it is now the port of call for mail steamers. Its principal exports are gold, wool and wheat.

Albany, on the fine harbour of King George Sound, has declined commercially with the growth of Fremantle, but it is still a naval coaling-station. It exports jarrah and karri wood from the forests behind it. *Geraldton* is a port for gold and wool, and *Bunbury* for coal and timber.

Hobart, the capital of Tasmania, is a thriving seaport with an excellent harbour at the mouth of the Derwent. It exports wool, apples and other fruits. *Launceston*, on the Tamar estuary in the north, exports minerals.

Shipping Routes

In normal times there is at least one large mail and passenger steamer weekly between Brisbane, Sydney,

Melbourne, Adelaide and Fremantle and the ports of the mother country. The Peninsular and Oriental and the Orient Lines take the route via Suez, as do also the German Lloyd and French Messageries Maritimes. The Aberdeen and Blue Funnel Lines go via the Cape of Good Hope. The former voyage is shorter, saving just over 1000 miles, or about a three days' journey, but the Canal tolls of 6*s.* 8*d.* per registered ton—and most of the large vessels exceed 10,000 tons—are an important consideration.

The new route via the Panama Canal reduces the distance from Sydney to New York from more than 13,000 to less than 10,000 miles, but it is almost as long as the Cape route to Great Britain and Western Europe. Its opening will, therefore, chiefly tend to increase the trade with America, especially in the importation of the manufactured articles of the New England States.

Regular services are maintained between Sydney, Vancouver and San Francisco, and also between the east Australian ports and Hong Kong and Yokohama.

Vessels of the New Zealand Shipping Company call at Hobart on their way out from London to Wellington, and there are regular services between the Australian and New Zealand ports.

A small and steadily decreasing number of sailing-vessels, assisted by the regular Brave West Winds or Roaring Forties, still make the homeward voyage round Cape Horn, returning by the Cape of Good Hope. About half the total shipping entering Australian ports from overseas is owned in the United Kingdom, the rest chiefly flying the flags of New Zealand, Germany, the Commonwealth and France. The vessels engaged in the local and inter-State trade are mainly Australian owned.

CHAPTER XLVIII

AUSTRALIA (*continued*)

POPULATION OF THE COMMONWEALTH—BRITISH NEW GUINEA

Density of Population—Aborigines, Chinese and Kanakas—" White Australia."

WITH an area of almost 3 million square miles, Australia had at the last census only about four and a half million people, that is, a population almost exactly equal to that of the County of London, which only covers 117 square miles.

The density of population for the whole Commonwealth is thus only 1·5 per square mile, but, of course, vast areas are still, and will probably always be, quite uninhabited. The most densely peopled States are Victoria with 15, Tasmania 7 and New South Wales 5 persons per square mile, while Western Australia has only 1 person to each 3½ square miles.

Two-thirds of the total population live in Victoria and New South Wales. Sydney and Melbourne (with over 600,000 each) together contain more than a quarter of all the people in Australia. Adelaide and Brisbane are the only other really large towns, containing nearly 200,000 and 150,000 people respectively. Perth, including Fremantle and other suburbs, exceeds 100,000.

Thus about half of the total population still live near the sites of the early settlements, and now get their living by working in the various manufacturing industries established there or in conducting the commercial transactions upon which the life of the colony depends. The other half are scattered in the smaller farming or mining towns and villages along the railways leading from the seaports to the interior.

There are still living in the country some 20,000 pure-blooded *aborigines*, although they are fast dying out in their contact with the white man, the largest numbers being found now in Queensland and Western Australia. In Tasmania they are now extinct. They are a dark-brown race, unlike the natives of any other part of the world. They are nomads and live by hunting, constructing no dwellings and practising many hideous customs, including cannibalism. Reserves are now set apart for them in the various States, and efforts are made to teach them the rudiments of civilisation, but they make little or no progress.

There are still some 25,000 *Chinese* in Australia, mostly in the Eastern States, but their numbers are decreasing, and further immigration is prohibited. They came originally to the gold diggings, and in this connection it is interesting to note that Western Australia is the only State in which their numbers have increased in recent years.

The *Kanakas*, or natives of the small Pacific Islands, imported to work in the sugar plantations, are now being deported, and no further contracts are made with the islanders. This, together with the "dictation test" imposed upon all coloured immigrants, is a part of the policy to reserve "Australia for the white man." In order to get sufficient numbers to fully develop all the resources of the country and to provide adequate defence against possible attacks which this exclusion policy may provoke, the Government spend large sums in order to encourage immigrants from the mother country and Western Europe. The money is spent in advertising the opportunities that Australia offers to the settler, and in assisting emigrants of the right class to reach the country. Thus farm labourers can travel from London to Sydney at an inclusive cost of £6, and be assured of work on arrival.

In 1912 some 167,000 immigrants entered the

country, more than half coming from the United Kingdom.

Papua, or British New Guinea

This territory, which has been administered by the Commonwealth Government since 1901, is situated at the south-east corner of the island of New Guinea. It is about as large as Great Britain. In the east it consists of a high, mountainous peninsula rising in Mount Owen Stanley to over 13,000 ft., but in the west there is a broad plain between the mountain ridge and the Gulf of Papua. The mountains are rich in *gold*, *copper* and other minerals, which are not yet fully exploited, but form the chief commercial wealth of the territory.

The *climate* is distinctly tropical in the lowlands, the mean shade temperature varying little from 80° F. throughout the year. The South-East Trades blow steadily across the island in the cooler months (June to October), but are reversed when the "hot belt" has moved southwards over Australia. At the south-east corner, where the mountains are high and exposed to both winds from off the sea, the rainfall exceeds 100 in. per annum, but at Port Moresby, where the coast lies parallel to the south-easterly winds and the mountains protect it from winds from the north, the rainfall is only about 30 in., which is very little for a place with such a high average temperature. The lowlands are unhealthy for Europeans, and the interior is still too undeveloped for the establishment of hill stations in the cooler highland regions, so that at present there are only about 1200 white men in the territory.

Most of the lowlands and all the hilly interior are covered with thick forest, in which the native Papuan tribes live by fishing, collecting fruits and primitive agriculture. Crocodiles and poisonous snakes abound, but there are few animals useful for food, which may

account for the cannibalistic tendencies of some of the tribes.

Productions. The *coconut palm, sisal hemp* and various tropical timbers, including *sandal wood, ebony* and *cedar,* provide articles for export. Plantations of the two former crops, as well as of *rubber, cocoa, vanilla, cinnamon* and other spices, have now been laid out in the lowlands, and of *tea, coffee, cotton* and *tobacco* at greater elevations. Coast fisheries provide *pearls, mother-of-pearl, tortoise-shell* and *bêche-de-mer.* These products are exported in exchange for various foodstuffs, hardware and clothing. Most of the trade is carried on with Australia, there being regular steamship connection between Port Moresby and Sydney, and intermittent traffic between other ports of the territory and Eastern Australia.

Port Moresby, situated on a good harbour in a relatively dry and healthy district, is the residence of the Governor. *Samarai,* on an island off the south-east corner, and *Daru,* west of the Fly River estuary, are other trading ports. The Fly River gives 500 miles of navigation into the interior, and it should be noticed that the rivers and native forest tracks are at present the only means of communication. There is a wireless station at Port Moresby.

The Woodlark and Louisiade Islands, which form part of the territory, are rich in gold.

The territory has about a quarter of a million natives, some of whom are becoming sufficiently educated to assist in the development of the various vegetable and mineral resources of the country by the white planters and prospectors.

Thursday Island is a fortified coaling-station in Torres Strait. It is also the centre of pearl fisheries.

[1] The late German Colony of New Guinea, which adjoins British New Guinea on the North, and also the neighbouring Bismarck Archipelago, are now administered by the Australian Commonwealth.

CHAPTER XLIX

THE DOMINION OF NEW ZEALAND

Discovery—Physical Features—Climate.

SITUATED almost at the opposite side of the globe, at a distance of 12,000 miles from the mother country and 1200 miles from the nearest continent, New Zealand was naturally late in developing as a British colony. Tasman, the famous Dutch explorer, was probably the first European to see the country on his voyage in 1642, but the fierce storms of the Roaring Forties, the forbidding coasts of South Island and threatening attitude of the native Maoris, gave him a bad impression of the country, and it was left to Captain Cook, on his first famous voyage and subsequent journeys, to give a fuller and more satisfactory account of the islands. The story of his first visit is outlined by the names of some of the coast features of North Island. His first landing was in Poverty Bay, and an unsatisfactory cruise to the southward led to Cape Turnagain. Retracing his course, he rounded East Cape, and entered the more propitious Bay of Plenty. Rounding North Cape he cruised along the west coast, and navigating Cook Strait showed the existence of two main islands. Leaving the country by Cape Farewell, he eventually landed on the shores of Australia at Botany Bay in 1770. Having carefully mapped out the coasts in subsequent voyages, the islands became useful to British sailors engaged in the whale and seal fisheries of the southern sea, and a small trade with the Maoris was opened up in timber, New Zealand flax and native curios. The first settlement of British farmers was not, however, made till 1840, and it was not till thirty years later, after much blood had been shed in the Maori wars, that the country really became settled.

PHYSICAL FEATURES. The Dominion consists of the two main islands, separated by Cook Strait, and having about five-sixths the area of Great Britain and Ireland, together with Stewart Island and a number of isolated groups in the Pacific and Southern Oceans, of which the Cook, Chatham and Auckland Islands are the chief. Neither island is anywhere more than 200 miles wide, and no place is more than seventy miles from the sea. Thus the climate is equable and, on account of the latitude, temperate; and all parts sufficiently low to be inhabitable are within easy access of the sea. Each island has a *mountainous backbone:* in the North it is largely volcanic, and in the South high and snow-capped, with many glaciers. The mountains are sufficiently high, especially in South Island, to offer serious obstacles to communication, and the coach-road over *Arthur's Pass*, now being supplemented by a railway tunnel half-a-mile above sea-level, is the only east-and-west route available.

The mountain barriers have thus restricted settlement to the coastal plains, especially in the neighbourhood of *good harbours*, such as *Port Nicholson* (Wellington), *Port Lyttelton* (Christchurch), *Waitemata* and *Manukau Harbours* (Auckland), *Otago Harbour* (Dunedin) and the *Bluff* (Invercargill). The mountains, however, attract sufficient rainfall, provide abundant timber, and in some parts contain valuable supplies of gold, coal and other minerals. They largely determine the course of the railways which connect up the well-peopled centres along the coasts.

The *rivers*, having necessarily a steep descent and very short courses to the sea, are nearly all too swift to be of much use for navigation, the *Waikato* in North Island and the *Clutha* in the South being the only ones of any considerable value. Large deposits of alluvium spoil their estuaries for harbours. The *Hot Lakes* in the volcanic district of North Island have curative properties, and both they and the

beautiful Cold Lakes, set in the old *glacier valleys* among the high *Southern Alps*, are famous for their scenery, which has given them more than a local reputation, and attracts wealthy tourists from America and Europe, as well as from Australia.

The long, narrow, winding and deep-watered *fiords* of the south-west coast, set among the well-timbered and snow-capped mountains, are also strikingly beautiful, and although they make excellent harbours, the unproductive country behind them and difficulty of communication will probably prevent the development of any busy seaport on their shores.

Climate. As New Zealand extends for about 1000 miles from north to south, there are ample possibilities for variety of climate. But no part of the islands is within the tropics, and no part is so far away from the Equator as is even the South of England. This, added to the narrowness of the islands and their great distance from any mass of land, gives to the whole country a climate temperate and equable, with at least a sufficiency of rainfall in all parts; so that, except where the land is too high or rocky, it is eminently suitable for the highest forms of human activity.

Temperature. The seasons are, of course, the reverse of those in the mother country. Christmas comes at midsummer. January is the hottest month, and the mean temperatures for this month range from 67° F. at Auckland to 57° F. at Invercargill, being surprisingly low when the latitude is considered. The mean temperatures for the same two places in July, the coldest month, are 51° F. and 41° F. respectively. So that the rivers are not frozen, and frost and snow are rare, even in the south, except among the high mountains, which are always snow-capped. The small differences between summer and winter temperatures make the climate very congenial. Agricultural operations are never interfered with, and cattle can remain outdoors throughout the winter,

except in the higher mountain pastures, which are often cold and wet.

Rainfall. In both islands rainfall is well distributed throughout the year, and the periodic droughts experienced in Australia are unknown. In North Island rain is chiefly brought by the South-East Trade Winds in summer (December to February), and by the Brave West Winds or Roaring Forties in winter (June–August), and as the island is narrow and both winds come from the sea, all parts get a fairly equal amount of rain, varying between 40 and 60 in. per year. Thus, although in the latitude of the Mediterranean, the summer droughts, so characteristic of the Mediterranean climate, are not experienced in New Zealand, and it has already been seen that the summer temperatures are not nearly so high. Consequently, although oranges and lemons and grapes ripen outdoors, the latter do not make as good wine as those ripened in the intensely hot summer of the Mediterranean countries and South Australia. The rainfall, too, is rather too heavy for successful wheat growing.

South Island lies just within " the forties " (lat. 40°–46° S.), and the stormy westerlies sweep across it all the year round. Consequently, the west coast has very heavy rainfall, everywhere exceeding 100 in. per year. At Hokitika, the wettest month (December) averages 12 in. and the driest (April) 8 in. The east coast, under the lee of the Southern Alps, is much drier, and the mean annual rainfall on the Canterbury Plains is less than 30 in. a year. Thus the western mountains produce fine timber, while the drier plains make excellent sheep pastures, and, where the soil is fertile, yield good crops of wheat and other cereals.

CHAPTER L

NEW ZEALAND

INDUSTRIES AND PRODUCTIONS

Forestry—Fishing—Pastoral Industries—Agriculture—Mining-Manufactures.

Forestry. About a quarter of the country is still covered with forests, containing a very varied and beautiful flora and many valuable timber trees, chief among which are the *kauri* and *totara pines* and several varieties of *beech* trees. For the sake of cheapness and ease of construction, and in the North Island on account of the frequency of earthquake shocks, most of the houses of New Zealand are built of timber, and the Government Buildings at Wellington are probably the largest wooden structure in the world. Saw-milling comes next only to the industries concerned with meat-preserving and dairy produce in the value of its output. Some timber is exported to Australia and the Pacific Islands. But from the value of the export *kauri gum* is more important than the timber. This is exuded and collected from the growing trees, but the largest quantities are found in a fossil state buried several feet in the ground on the site of ancient forests of the kauri pine in the Auckland peninsula, where gum-digging is the means of livelihood to several thousand Maoris and colonists. The gum is used in the making of the finest varnish.

The New Zealand forests have a remarkable lack of wild animals and birds of any value, the gigantic wingless moas, once hunted for food by the Maoris, being now extinct.

Fishing. The New Zealand rivers contained few native fish, except large eels, but they have been stocked with trout, perch, tench and other fish, which seem to thrive. The surrounding seas abound with

fish of several kinds, the *schnapper* being a characteristic species. Quantities of these, and *oysters* obtained from the Bay of Islands in the extreme north and Stewart Island in the South, are exported to Australia; but so far the fisheries have received very little attention, farming and mining offering easier and less precarious means of livelihood. Auckland and Dunedin are the chief fishing ports, steam trawlers having been introduced.

Pastoral Industries. These have always been the main support of the colony, and nearly two-thirds of the country is still devoted to pasturing sheep and cattle. Four-fifths of the total exports are the products of these industries. Some of the drier parts are naturally covered with the wiry tussock grass, which makes suitable sheep pasture, but nearly 15 million acres have been sown with richer English grasses, often upon the ashes of burnt forest lands.

Sheep. In 1912 there were nearly 24 million sheep in the colony. They are not native to New Zealand, and the first herds were of the celebrated Merino and Lincoln breeds, introduced via Australia, and famous for their *wool.* But when the establishment of lines of steamers with cold storage made it possible to send the carcases of *mutton* as well as the wool on the long voyage to England, other breeds, famous for their flesh rather than their wool, were introduced.

The dry Canterbury Plains were once regarded as the finest area for sheep, but with the increase of agriculture in that district it now stands third to the districts of Wellington and Otago in the number of its flocks. Hawke's Bay and Auckland districts also each have more than three million sheep, and the only districts with less than a million each are the very wet western districts of Taranaki, Westland and Southland. Owing to the richer pasture, the sheep runs of New Zealand are much smaller than in Australia, and half the flocks number less than 500 sheep each. The sheep are sheared by machinery, and their wool,

the chief export of the colony, was valued at £8,000,000 in 1913.

Cattle exceed two million in number, about three-quarters of the total being kept in the North Island on the well-watered plains, especially of the Auckland and Wellington districts. Otago is the chief cattle-rearing district in the South Island. Owing to the mildness of the climate winter housing and growing of root crops for winter food for the cattle are unnecessary, and the good climate and rich pastures make dairy farming profitable. New Zealand *butter* and *cheese*, now made and exported in large quantities, have an excellent reputation. *Pigs* are now being reared in increasing numbers, especially in the dairy-farming districts, and bacon-curing factories have been established at several places.

Horses are reared in Auckland, Otago, Canterbury and Wellington, and in 1912 two thousand were exported to Australia.

Agriculture. About two million acres of land in New Zealand have now been brought under cultivation for cereals, root crops and fruit. Comparatively small farms are the rule, more than half the holdings not exceeding 200 acres. Land up to 5000 acres may be purchased from the Government at prices varying from half-a-crown to twenty pounds per acre, according to the nature of the soil and distance from a settled district. Most land needs clearing of trees or ferns before it can be cultivated. Farming is nearly always of the mixed type, the corn and fruit growers always keeping larger or smaller flocks of sheep and cattle as well.

The largest areas under cereals and roots are in the Canterbury and Otago districts. The rich soil and relatively dry climate makes the former particularly suitable for the growth of *wheat*, two-thirds of the total acreage being in that district. The yield is very high, averaging about 30 bushels to the acre, but the grain is not so hard as that grown in the southern districts

of Australia. *Oats*, too, are largely cultivated in the same two districts, but owing to its moister climate Otago has more than half the total acreage of this crop. *Barley* is grown to a smaller extent, that used in brewing being mainly cultivated in the Nelson and Marlborough districts, where hops for the same industry are also grown. *Maize* is grown in the warm, moist Auckland district.

Most of the cereals grown are consumed in the colony, but a small export is beginning.

Fruit-growing is increasing in importance, as the soil and climate are suitable; and by careful packing it is possible to place fruit upon the English market in good condition at a season when home-grown fruit is scarce.

Auckland is the chief fruit-growing province, as, in addition to English fruits, *oranges, lemons, olives, grapes* and even *bananas* can also be grown. In the central districts, especially Wellington and Nelson, there are many orchards of *apricots, peaches*, etc., and *apples* thrive in Otago.

Phormium, or *New Zealand flax*, a plant with long, narrow leaves, something like the iris, grows along the rivers, and from the fibres of the leaves the Maoris make the matted cloth which they use for clothing. The plant is now cultivated particularly in the Wellington, Auckland and Otago district, and the fibre is prepared for export in large quantities, to be used in the making of rope and sailcloth, and for mixing with other yarns in the making of finer textiles. Its great rival in the market is Manila hemp, which provides a cleaner fibre, and is prepared much more cheaply by the ill-paid natives of the Philippine islands.

MINING. Gold and coal are by far the most valuable minerals worked in New Zealand, the quantities of others at present obtained being almost negligible.

Gold. As in most countries, the output is now showing a fairly steady decline. The alluvial work-

ings are practically exhausted, and the gold is obtained by the more laborious and expensive methods of quartz-mining. The richest mines are in the Coromandel Peninsula of Auckland district, between the Buller and Grey Rivers in Nelson and Westland, and in the Clutha Valley in Otago. The total output in 1913 was valued at one and a half million pounds, most of which was exported.

Coal is most extensively mined in the country behind Westport and Greymouth on the west of the South Island, in the lower Clutha Valley of Otago and the Waikato Valley of Auckland. The coal is of good quality, but is not yet produced in quite sufficient quantity to supply the whole needs of the colony. The deficiency is supplied from New South Wales.

Silver is obtained in small quantities in the gold-mining districts, especially in Auckland, where there are also *granite* quarries. There are *petroleum* wells and refineries near New Plymouth.

Manufactures. Factories for the elaboration of raw materials for use in the colony and for export have been set up in the larger towns, and these now employ rather more workers than are engaged in the primary industries of farming and mining. In order of the value of their produce, the principal types of factories are engaged in *meat freezing* and preserving, *manufacturing butter and cheese*, *saw-milling* and woodwork, *making textiles and clothing*, *tanning* and *wool-scouring*, *printing* and *bookbinding*, *flour-milling* and *engineering*. *Breweries*, *gas-works* and *flax-mills* also employ considerable numbers.

Large quantities of manufactured goods, especially clothing and iron and steel goods, are still imported, but, with the further development of its coal-mines, and the harnessing of the great water-power supplied by its high mountains and heavy rainfall, this may in time become unnecessary, and the colony may prove entirely self-supporting.

CHAPTER LI

COMMUNICATIONS, COMMERCE, POPULATION AND GOVERNMENT

New Zealand has nearly 3000 miles of *railway*, almost entirely owned by Government. The lines chiefly traverse the coastal plains in both islands, connecting the larger seaports, and there are short branches from these to the productive inland districts. In North Island the main lines run from Wellington to New Plymouth in the west and Napier on the east coast, and across the volcanic mountain district of the centre to the Waikato Valley and Auckland. Branches run to the celebrated Hot Lakes District and the mining centres of the Thames Valley and Coromandel Peninsula. The districts untouched by the railway are reached by coach-roads. In the South Island the main line runs from Christchurch to Invercargill via Timaru, Oamaru and Dunedin, sending off many branches into the Canterbury Plains and into the mining and fruit-growing districts of the Clutha and other rivers of Otago and Southland. The west coast ports of Hokitika, Greymouth, Westport and Nelson have short lines to the coal and gold-mining districts behind them, and will soon be connected with Christchurch by the tunnel under Arthur's Pass, the connection at present being by coach-road through the picturesque Otira Gorge and over the pass.

All towns are connected by telegraph, and there are *submarine cables* from Wellington to Sydney, and from Auckland via Norfolk Island, Fiji and Fanning Island to Vancouver, so that the Dominion has direct communication by an " all red route " with London.

Commerce and Seaports

The total trade per head of population is greater for New Zealand than for any other unit of the British

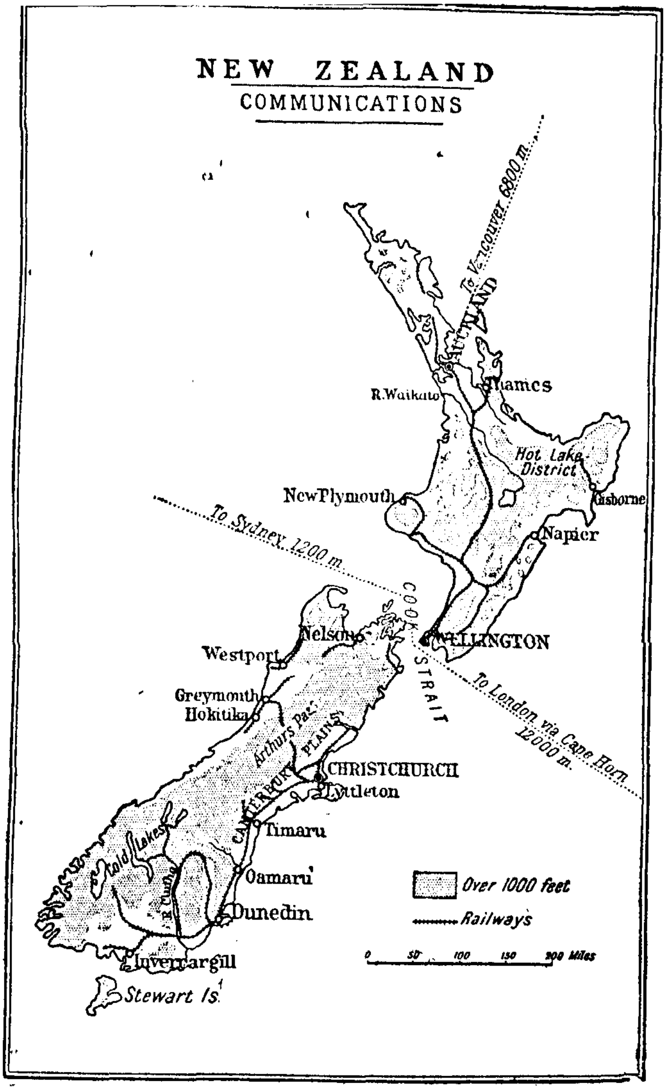

NEW ZEALAND
COMMUNICATIONS
To Vancouver 6800 m.
AUCKLAND
Thames
R. Waikato
Hot Lake District
Gisborne
New Plymouth
Napier
To Sydney 1200 m.
COOK STRAIT
Nelson
Westport
WELLINGTON
To London via Cape Horn 12000 m.
Greymouth
Hokitika
Arthurs Pass
CANTERBURY PLAINS
CHRISTCHURCH
Lyttleton
Cold Lakes
Timaru
R. Clutha
Oamaru
Over 1000 feet
Dunedin
Railways
0 50 100 150 200 Miles
Invercargill
Stewart Is.

FIG. 41.

Empire, and there is no town of any size, except Christchurch, which is not a seaport. This is probably due, in large measure, to the comparative newness of the colony. The settlers coming from a highly developed country, and wishing to live up to something of the same standard, found it necessary to keep up constant communication with the mother country, which could supply them with manufactured articles necessary to their style of living, and which it would be impossible to obtain in the newly established country. These articles could only be purchased with the surplus produce of the farms and mines of the colony, and as these articles, particularly the wool and frozen mutton, were in great demand in the mother country, the colonists found the easiest means of obtaining a livelihood was to carry on this commerce. Consequently they established their settlements where this could be done most easily, that is, in fertile districts near to a harbour.

Wool accounts for a third of the total exports, *frozen meat* for a fifth, and *butter and cheese* for another fifth. *Gold, hides* and *leather, grain* and *flour, tallow, kauri gum* and *phormium fibre* are other valuable items. Four-fifths of the exports find their way to the mother country, and most of the rest to Australia.

The imports are mainly manufactured articles, a fifth of the total being accounted for by *textiles* and *clothing*, and another fifth by *iron and steel goods and machinery*. Books, sugar, oils, wine and spirits, tobacco and tea are also imported in considerable quantities. About three-fifths of the total, consisting chiefly of goods in the first two classes, come from the United Kingdom. Australia supplies about one-eighth and the United States a tenth of the total. To encourage manufacturing in the colony there are heavy protective duties on most manufactured articles, a reduction being made in favour of articles from Great Britain. On this account direct trade between European countries and New Zealand is small, although

undoubtedly some is carried on indirectly through the mother country.

The four chief seaports in order of total trade are Wellington, Auckland, Lyttelton and Dunedin.

Wellington is now the capital and seat of Government. It is centrally situated on Port Nicholson, a good harbour on the northern shore of Cook Strait. Railways connect it with all the settled parts of the North Island and steamships with the South Island. It has railway works, saw-mills, flax-mills, butter and cheese factories, and meat-freezing and preserving works.

Auckland, the old capital and still the largest town, is finely situated on a narrow isthmus separating the Waitemata, or eastern, and Manukau, or western, harbours; the former being the better and most frequented by shipping. It is the collecting and exporting centre for the kauri gum and fruit from the peninsula to the north, the gold and coal of the Coromandel Peninsula and the Waikato valley, and of a considerable pastoral industry. Fruit-preserving, saw-milling and flax-mills are important. It has regular steamship connection with San Francisco via Honolulu and with Sydney. Its fisheries are important.

Lyttelton is the port of Christchurch, the third city of the Dominion, and of the richest portion of the Canterbury Plains. It has fine docks, from which are exported large quantities of wool and frozen mutton, and some grain. It is connected by rail with Christchurch, eight miles inland.

Dunedin is situated on the fine Otago harbour, at the mouth of which is Port Chalmers, where large vessels are berthed. It is the outlet of the products of the agricultural, pastoral and mineral industries of the rich Otago province, and has factories of all kinds.

Invercargill, connected by railway with Bluff Harbour, seventeen miles away, is the outlet for the sheep and dairy farms, gold and coal-mines, saw-

mills and orchards of the Southland district. It also has freezing establishments, flax-mills and fisheries.

Wanganui, Napier, Timaru, Greymouth, Hokitika and *New Plymouth* are small but growing centres of productive districts.

The New Zealand Shipping Company keeps up regular communication with the mother country. The route to London is by Cape Horn, Buenos Ayres, Rio Janeiro, and the return is made via the Suez Canal, Colombo and Sydney. The Panama Route would save some 1300 miles on either of these routes, but it is doubtful whether this would balance the cost of the canal dues and the loss of cargo and passenger traffic from intermediate ports.

Population and Government

At the census of 1911 the Dominion had just over one million inhabitants, about three-fifths of whom lived in the North Island. The average density of population for the whole country is just over 10 to each square mile, the average being exceeded in the provinces of Wellington (19), Taranaki (18), Canterbury (13), Hawke's Bay (12), and Auckland (11). The most thinly peopled are Marlborough (3), Westland (4), Nelson (5), Otago and Southland (8).

About half the population live in towns, many very small in size, and only Auckland with its suburbs exceeds 100,000 people.

The population includes about 50,000 Maoris, and rather less than 3000 Chinese. The numbers of the former, though only about half the total of natives originally in the islands, now keep fairly constant, but the Chinese are diminishing, and further immigration is discouraged by a landing tax of £100 per head. The excess of white immigrants over emigrants averages about 6000 a year.

The Dominion is self-governing, having a Governor appointed by the King, a Legislative Council of 42,

including 2 Maoris, and a House of Representatives of 80 members, including 4 Maoris, Councillors being elected for seven and Representatives for three years.

CHAPTER LII

BRITISH ISLANDS IN THE SOUTH PACIFIC

Chief Groups—"High" and "Low" Islands—Climate and Productions—People.

Of the thousands of islands dotted over the South Pacific Ocean, several hundred are controlled by the British Governor of Fiji and High Commissioner for the Western Pacific. The largest groups are Fiji, the Solomon Islands, the Friendly or Tonga Islands, and the Gilbert Islands. The Auckland, Chatham and Cook Islands are under the control of New Zealand, and Norfolk Island is administered by the Government of New South Wales.

Physically the islands are classed as "high" or "low." The former are of volcanic origin, some rising out of seas two miles deep to a height of two miles above sea-level. Disastrous eruptions, earthquakes and resulting tidal waves still sometimes affect these islands. Most of them are fringed with reefs built up by coral polyps in the clear, warm, salt and shallow waters near the shores, and the calm waters inside the reef afford good anchorage for ships.

The low islands are entirely built of coral. Some are simply masses of coral built on the top of a submerged ridge or a volcanic peak which has just failed to reach the surface, while others are arranged in a more or less complete ring around a smooth lagoon. The latter arrangement is known as an *atoll,* and is supposed to be due to the slow submergence of a volcanic island around which the polyps had built up

a fringing reef, the polyps continuing to build at a rate comparable with that of the submergence. The lagoon of an atoll is sometimes several miles in width and makes a fine harbour for ships, which can usually enter by one or more natural openings through the coral ring, which is seldom more than a quarter of a mile wide at most, and rises only a few feet above the surface of the sea.

CLIMATE AND PRODUCTIONS. *The volcanic soil of the high islands is very fertile*, and as from their height and position they receive heavy rainfall, they are usually very productive, and therefore well peopled; but the decomposed coral makes a very poor soil, so that the coral islands have few productions or inhabitants.

Owing to their situation, all of the islands within the tropics have a *warm, equable climate* with sufficient rainfall, and where the soil is fertile *coconut palms, sugar-canes, bananas* and many other fruits flourish. The windward sides of the high islands are usually well-timbered, owing to the heavy rainfall. Coconuts, bananas and other fruits form the staple food of the natives, and *copra*, or dried coconut kernel, from which oil is extracted for soap-making, is the chief article exported from most of the islands. In Fiji, however, there are large sugar plantations, and *sugar* and *molasses* are more valuable commercially.

PEOPLE. The natives of the islands are classified as Melanesians, who mainly inhabit the more westerly islands, and Polynesians, chiefly found to the east of Fiji, in which island both races are found. The former are a race of short, woolly-haired negroes, while the latter are taller and light-brown in colour, with wavy hair. They live in tribes, acknowledging the rule of their chiefs. Their houses are usually built on the lee sides of the islands, or around the lagoons of the atolls, and are constructed of wood and leaves. Most are skilful fishermen, and construct very serviceable canoes with sails of bark cloth, in which they sometimes

make considerable voyages. Fish is the only non-vegetable food of most of the islanders, but cattle, sheep and pigs are now reared in Fiji. Clothing is very scanty, and is made of bark cloth. Having few wants, which are easily satisfied, they are, on the whole, very happy and contented. Various heathen forms of worship are common, but many now profess Christianity. In the *Fiji Islands*, which cover an area as large as Wales, there are about 90,000 natives, 40,000 Indians and about 4000 Europeans, besides a few Chinese and natives from other islands. Of the other groups, the *Solomon Islands* have an area of about 15,000 square miles and a native population of about 150,000. They export copra and pearl shells. The *Gilbert Islands* have large and valuable *phosphate deposits*, which are worked and exported.

Most of the exports of all the islands go to Australia and New Zealand, which send in return various foodstuffs and manufactured articles.

Suva, on Viti-Levu, the largest of the Fiji islands, is the chief seaport, situated on a good harbour. Its exports exceed a million pounds in annual value, sugar accounting for two-thirds and copra a quarter of the total. It is connected by cable with Brisbane and Auckland via Norfolk Island, and with Vancouver via Fanning Island, and also has a wireless station. It is a coaling-station for vessels trading between Western Canada, Australia and New Zealand, and has steamer connection with other island groups in the Pacific.

The largest of the Samoan Group of Islands, formerly under German control, are now administered by New Zealand. The islands are of the "high" type, fringed with coral reefs, and are well watered and fertile. *Apia*, on Upolu, famous as the home of Robert Louis Stevenson, is the chief seaport, exporting *copra* and *cocoa* beans, and receiving manufactured goods chiefly from Australia and New Zealand.

APPENDIX

I. Tanganyika Territory

This is the name given to the greater part of the old German East Africa, which is now administered by Great Britain under a mandate from the League of Nations.

It is rather more than three times the size of the British Isles and resembles the Kenya Colony in physical features and climate (see p. 222). It has about eight million inhabitants mostly of mixed Bantu race, who keep herds of cattle, sheep and goats on the plateau or work on the plantations of tropical produce established by the Germans in the coastal plains. The old owners had also established many good roads, two railways and lake and river steamer services, to develop the colony and to collect the *sisal fibre, cotton, hides, copra, ground nuts, rubber* and *ivory*, which are the principal exports in order of value.

Dar es Salaam, situated opposite a gap in the coral fringe of the coast, is the capital and chief seaport. It is also the terminus of the Central Railway, which is the main commercial artery of the country, running 780 miles to *Kigoma* near Ujiji on Lake Tanganyika, the spot made famous by the historic meeting of Stanley and Livingstone in 1871. This railway will also link up with the proposed Cape to Cairo Route which could now be constructed entirely through territory under British control.

The other railway runs inland from *Tanga* 220 miles to New Moshi near the foot of Mt. Kilima Njaro.

The principal imports are cotton goods, chiefly from Great Britain, and various foodstuffs from India, direct or via Zanzibar and Mombasa, which share most of the trade of the colony.

II. South-West Africa

This old German colony is now administered by the Union of South Africa under a mandate from the League of Nations.

It is almost three times the area of the United Kingdom and consists of a coastal plain some fifty miles wide, rising to the plateau, which has an average height of nearly a mile above sea level. The country is almost bisected by the Tropic of Capricorn, so that the temperatures on the plateau are pleasant. From May to October the region is in the belt of calms and the season is cool and dry. The other half of the year is hot, and moderate rains are brought to the northern districts by the South-easterly Trades. The south of the country and the coastal plains receive very little rain at all and are desert, the cold Benguela Current which flows northward along the coast emphasising these conditions.

Before the coming of the Europeans the country supported some 200,000 natives, mostly pastoral nomads, although many of the Ovambos of the north, who are still the most numerous, were settled agriculturalists cultivating maize and lucerne. The Hereros, an independent pastoral Bantu race, were reduced in numbers, from about 100,000 to about 20,000, by a punitive expedition of the Germans in 1904. These two races and a few of the more primitive Bushmen and Hottentots supply the labour for the Government experimental fruit, tobacco and cotton farms in the north, and for the mines, which are the chief attraction for Europeans

in the colony. Small deposits of all kinds of minerals have been found, but *copper* and *diamonds* are the most valuable. The diamonds are found along the coast, especially around *Luderitz Bay* in the south, and the richest copper mines are in the *Otavi* district in the north, and around the capital, *Windhuk*. Valuable *coloured marble* is worked near *Karibib*.

For its size and wealth the colony is well supplied with railways, many of which were constructed for strategical reasons. From De Aar Junction on the Cape Railway System (see p. 191) a line goes north-westward crossing the Orange River at Upington and entering the south-west corner of the colony. It proceeds through the pastoral belt northward to *Windhuk*, the capital, and is continued to the mines and farms of *Otavi*, *Tsumeb* and *Grootfontein* in the north. Branch lines run down to Walvis Bay from Karibib, and to Luderitz Bay from Keetmanshoop. *Walvis Bay*, which has been British since 1878, has good sheltered anchorage and will tend to become the chief seaport of the colony, as the German port of *Swakopmund is on an open roadstead*. *Luderitz Bay* also has a good harbour and has become important owing to the diamond industry.

There are about 15,000 Europeans in the colony, most of whom are Germans, although there are 2000 British, chiefly engaged in administrative work and the direction of mines, farms and commerce, all of which are capable of considerable extension. At present *copper*, *diamonds* and *hides* are the chief exports, but beef, wool and mohair should soon be added to these.

Table A.

ECONOMIC STATISTICS FOR 1913.

Possession.	Area (1000 sq. miles.)	Population.		Total imports £ million.	Total exports £ million.	Imports from U. K. £ million.	Exports to U. K. £ million.	Shipping tonnage.		Railways Miles.	Immigrants from U. K. (thousands).
		Total millions.	Per sq. mile.					Owned (1000 tons).	Entered and cleared (million tons).		
United Kingdom	122	46	380	769	635	—	—	11,895	152	23,441	—
India	1,802	315	175	107	161	74	40	104	17	33,484	—
Canada	3,729	8	2 (+)	135	78	28	36	836	25	29,304	196
Australia	2,974	5	2 (—)	80	79	48	35	440	10	18,721	76
Union of S. Africa	473	6	13	42	67	22	60	15	10	8,393	26
New Zealand	104	1	11	22	23	13	18	156	3	2,889	15
Newfoundland	163	·2	1·5	3	3	1	1	149	2	770	—
Rhodesia	440	2	4	3	3	2	3	—	—	2,406	—
British W. Indies	12	2	144	11	10	4	2	68	20	318	—
Ceylon	25	4	164	12	13	3	7	10	15	604	—
W. Africa	452	21	46	13	13	8	6	5	8	1,405	—

TABLE B.

TRADE STATISTICS FOR THE UNITED KINGDOM, 1913.

	Imports.	Value £ Million.
Foodstuffs 290	Wheat and Flour	50
	Butter	24
	Sugar	23
	Beef	19
	Bacon	17
	Fruits	16
	Tea	14
	Maize	14
	Mutton	11
	Eggs	10
	Other Foodstuffs	92
Raw Materials 282	Cotton	71
	Wool	34
	Timber	34
	Rubber	20
	Oil Seeds	12
	Petroleum	10
	Other Raw Materials	101
Manufactures 197	Iron and Steel Goods	15
	Other Metal Manufactures	32
	Silk Goods	15
	Leather and Leather Goods	14
	Cotton Goods	12
	Woollen Goods	10
	Chemicals	13
	Other Manufactures	86
	Total	769

	Countries Supplying *Imports*.	Value £ Million.
British Possessions 192	India	43
	Australia	38
	Canada	30
	South Africa	21
	New Zealand	20
	Straits Settlements	16
	Other British Possessions	24
Foreign Countries 577	U.S.A.	142
	Germany	81
	France	46
	Argentine	42
	Russia	40
	Denmark	24
	Holland	24
	Belgium	23
	Egypt	21
	Spain	14
	Sweden	14
	Switzerland	11
	Brazil	10
	Other Foreign Countries	85
	Total	769

	Exports.	Value £ Million.
Foodstuffs 33	Foodstuffs	33
Raw Materials 70	Coal	51
	Other Raw Materials	19
Manufactures 423	Cotton Goods	127
	Iron and Steel Goods	54
	Woollen Goods	38
	Machinery	37
	Chemicals	22
	Clothing	16
	Ships (new)	11
	Other Manufactures	118
	Re-exports	110
	Total	635

	Destination of *Exports*.	Value £ Million.
British Possessions 209	India	72
	Australia	39
	Canada	27
	South Africa	22
	New Zealand	12
	Other British Possessions	37
Foreign Countries 426	Germany	61
	U.S.A.	59
	France	41
	Russia	28
	Argentine	23
	Holland	21
	Belgium	21
	Italy	16
	China	15
	Japan	14
	Brazil	13
	Other Foreign Countries	114
	Total	635

STATISTICAL APPENDIX

Table A.

ECONOMIC STATISTICS FOR 1913.

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	Sweden	14
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	Other Raw Materials	19
Manufactures 423	Cotton Goods	127
	Iron and Steel Goods	54
	Woollen Goods	38
	Machinery	37
	Chemicals	22
	Clothing	16
	Ships (new)	11
	Other Manufactures	118
	Re-exports	110
	Total	635

	Destination of *Exports*.	Value £ Million.
British Possessions 209	India	72
	Australia	39
	Canada	27
	South Africa	22
	New Zealand	12
	Other British Possessions	37
Foreign Countries 426	Germany	61
	U.S.A.	59
	France	41
	Russia	28
	Argentine	23
	Holland	21
	Belgium	21
	Italy	16
	China	15
	Japan	14
	Brazil	13
	Other Foreign Countries	114
	Total	635

TABLE C.

INDIA.

I.—GENERAL TRADE.

IMPORTS.	Value £ Million.	Countries Supplying *Imports*.	Value £ Million.
Cotton Goods	41	United Kingdom	74
Metals	10	Germany	7
Sugar	9	Java	6
Railway Material	4	U.S.A.	3
Machinery	4	Japan	3
Raw Silk	3	Austria	2
Oils	3	Belgium	2
Hardware	2	Mauritius	2
Woollen Goods	2	China	2
Provisions	2	Straits Settlements	2
Miscellaneous	27	Miscellaneous	4
Total	107	Total	107

EXPORTS.	Value £ Million.	Destination of *Exports*.	Value £ Million.
Rice	22	United Kingdom	40
Raw Cotton	19	Germany	17
Raw Jute	18	China	14
Manufactured Jute (sacks, etc.)	15	U.S.A.	12
Oil Seeds	15	Japan	12
Wheat and Flour	12	France	10
Hides and Skins	11	Belgium	9
Tea	9	Straits Settlements	6
Wool	2	Ceylon	6
Miscellaneous	38	Miscellaneous	35
Total	161	Total	161

II.—TRADE OF UNITED KINGDOM WITH INDIA.

IMPORTS from India.	Value £ Million.	EXPORTS to India.	Value £ Million.
Jute	9	Cotton Goods	39
Wheat	8	Iron and Steel Goods	9
Tea	8	Machinery	5
Oil Seeds	4	Woollen Goods	1
Rice	2	Miscellaneous	18
Cotton	1		
Miscellaneous	11		
Total	**43**	**Total**	**72**

Table C (*continued*).

Dominion of Canada.

I.—GENERAL TRADE.

Imports.	Value £ Million.	Countries Supplying *Imports*.	Value £ Million.
Iron and Steel Goods	21	U.S.A.	88
Coal and Coke	8	United Kingdom	28
Woollen Goods	5	France	3
Cotton Goods	4	Germany	3
Sugar	3	British E. Indies	1
Fruits	3	West Indies	1
Timber	3	Miscellaneous	11
Chemicals	3		
Miscellaneous	85		
Total	135	Total	135

Exports.	Value £ Million.	Destination of *Exports*.	Value £ Million.
Wheat and Flour	22	United Kingdom	36
Timber	9	U.S.A.	33
Cheese	4	West Indies	1
Silver	4	Newfoundland	1
Fish	2	Miscellaneous	7
Gold Quartz	2		
Miscellaneous	35		
Total	78	Total	78

II.—TRADE OF UNITED KINGDOM WITH THE DOMINION.

Imports from Canada.	Value £ Million.	Exports to Canada.	Value £ Million.
Wheat and Flour	11	Woollen Goods	4
Cheese	4	Cotton Goods	3
Timber	4	Iron and Steel Goods	3
Bacon	1	Clothing	1
Fish	1	Miscellaneous	16
Apples	1		
Miscellaneous	8		
Total	30	Total	27

Table C (*continued*).

Commonwealth of Australia.

I.—GENERAL TRADE.

Imports.	Value £ Million.	Countries Supplying *Imports*.	Value £ Million.
Metal Goods	12	United Kingdom . .	48
Clothing	5	U.S.A.	10
Cotton and Linen Goods.	5	Germany	5
Machinery	4	India	3
Timber	3	New Zealand	3
Chemicals	3	Belgium	2
Woollens	2	Ceylon	1
Sacks, etc.	2	Japan	1
Miscellaneous	44	Miscellaneous . . .	7
Total	80	Total	80

Exports.	Value £ Million.	Destination of *Exports*.	Value £ Million.
Wool	26	United Kingdom . .	35
Wheat	8	France	10
Hides and Skins . . .	6	Germany	7
Butter	4	Belgium	7
Beef	3	U.S.A.	3
Gold	3	New Zealand	2
Copper	3	British S. Africa . . .	2
Zinc	2	Japan	1
Lead	2	Miscellaneous	12
Tallow	2		
Mutton	2		
Miscellaneous . . .	18		
Total	79	Total	79

II.—TRADE OF UNITED KINGDOM WITH THE COMMONWEALTH.

Imports from Australia.	Value £ Million.	Exports to Australia.	Value £ Million.
Wool	12	Iron and Steel . . .	6
Meat	7	Cotton Goods . . .	4
Wheat	4	Woollen Goods . . .	3
Butter	3	Machinery	2
Hides	2	Miscellaneous . . .	24
Copper	2		
Tallow	2		
Miscellaneous . . .	6		
Total	38	Total	39

Table C (*continued*)

DOMINION OF NEW ZEALAND. I.—GENERAL TRADE.

Imports.	Value £ Million.	Countries Supplying *Imports*.	Value £ Million.
Clothing	5	United Kingdom	13
Iron and Steel Goods . .	5	Australia	3
Sugar	1	U.S.A.	2
Oils	1	Pacific Islands. . . .	1
Books, etc.	1	Miscellaneous	3
Miscellaneous	9		
Total . . .	22	Total . . .	22

Exports.	Value £ Million.	Destination of *Exports*.	Value £ Million.
Wool	8	United Kingdom . . .	18
Frozen Meat	4	Australia	2
Butter and Cheese . . .	4	U.S.A.	1
Gold	1	Miscellaneous	2
Hides	1		
Phormium Fibre . . .	1		
Tallow	1		
Kauri Gum	1		
Miscellaneous	2		
Total . . .	23	Total . . .	23

II.—TRADE OF UNITED KINGDOM WITH THE DOMINION.

Imports from New Zealand.	Value £ Million.	Exports to New Zealand.	Value £ Million.
Wool	8	Iron, Steel and Machinery .	2
Mutton	5	Cotton Goods	1
Cheese	2	Woollen Goods . . .	1
Tallow	1	Clothing	1
Skins	1	Miscellaneous	7
Butter	1		
Phormium Fibre . . .	1		
Miscellaneous	1		
Total . . .	20	Total . . .	12

TABLE C (*continued*).

UNION OF SOUTH AFRICA. GENERAL TRADE.

IMPORTS.	Value £ Million	Countries Supplying *Imports*.	Value £ Million.
Food and Drink . . .	8	United Kingdom . . .	22
Cotton Goods	3	U.S.A.	4
Machinery	[illegible]	Germany	4
Clothing	3	Australia	2
Hardware	2	India	1
Vehicles	2	Canada	1
Leather Goods	2	Holland	1
Miscellaneous	19	Miscellaneous	7
Total . . .	42	Total . . .	42

EXPORTS.	Value £ Million.	Destination of *Exports*.	Value £ Million.
Gold	38	United Kingdom . . .	60
Diamonds	12	Other Countries . . .	7
Wool	6		
Ostrich Feathers . . .	3		
Hides and Skins . . .	2		
Coal	1		
Mohair	1		
Miscellaneous	4		
Total . . .	67	Total . . .	67

TABLE D.

TRADE OF THE WHOLE EMPIRE WITH ALL FOREIGN COUNTRIES IN CERTAIN STAPLE PRODUCTS, 1913.

Product.	*Value of British* Imports from Foreign Countries in £ Million.	*Value of British* Exports to Foreign Countries in £ Million.	*Surplus* + or Deficit — in £ Million.
Wheat and Flour .	30	11	— 19
Meat . . .	46	5	— 41
Sugar . . .	36	2	— 34
Cotton . . .	71	35	— 36
Timber . . .	37	8	— 29
Oil	26	8	— 18
Coal . . .	12	52	+ 40
Wool . . .	10	38	+ 28
Hides and Skins .	10	25	+ 15
Cotton Goods . .	23	79	+ 56
Woollen Goods . .	13	27	+ 14
Iron and Steel Goods	60	59	— 1

Table E.

CLIMATIC STATISTICS.

Region	Station.	Mean Temperature in Degrees Fahrenheit. Hottest Month.	Coldest Month.	Range.	Mean Rainfall in Inches. Spring.	Summer.	Autumn.	Winter.	Annual.
United Kingdom	London	64	38	26	5	7	7	6	25
	Fort William	58	39	19	14	15	23	27	80
	Dublin	60	42	18	6	7	8	6	27
North America.	Vancouver	65 Au.	34	31	9	6	15	24	54
	Winnipeg	66	5	61	7	10	5	2	24
	St. John's (N.F.)	61	24	37	13	12	14	13	52
	Kingston (W.I.)	82	76	6	8	12	14	4	38
Asia.	Aden	89	77	12	1	0	0	0	1
	Lahore	94	55	39	3	9	7	1	20
	Bombay	84	74	10	0	50	32	0	82
	Madras	87	76	11	1	8	20	19	48
	Rangoon	83 May	75	8	14	59	26	0	99
	Colombo	83 May	79	4	27	16	31	11	85
	Singapore	83 Mar.	79	4	7	24	40	31	102
	Hong Kong	84 Au.	60	24	23	44	14	4	85
Africa. North.	Cairo	85	54	31	0	0	0	1	1
	Khartoum	92 May	71	21	0	4	1	0	5
	Accra	84 May	78 July	6	36	44	40	11	131
Africa. South.	Zanzibar	86	78	8	12	14	32	6	64
	Buluwayo	93	73 Jun.	20	6	12	4	0	22
	Bloemfontein	74	47	27	6	10	8	2	26
	Cape Town	70	55	15	5	2	7	13	27
	Pt. Elizabeth	71	57	14	6	4	5	5	20
	Durban	75	63	12	16	14	10	3	43
Australia.	Pt. Darwin	86 Nov.	78	8	7	40	16	0	63
	Sydney	72	53	19	9	12	16	13	50
	Melbourne	67	49	18	7	6	7	6	26
	Hobart	62	46	16	7	5	5	6	23
	Adelaide	74	52	22	5	2	6	8	21
	Perth	76	55	21	6	2	8	18	34
New Zealand.	Auckland	67	52	15	10	8	10	14	42
	Wellington	63	47	16	13	10	11	16	50
	Christchurch	66 Dec.	43 Jun.	23	7	6	7	5	25

Note.—"Spring" is reckoned as consisting of the three months, March, April, May for the Northern Hemisphere, and September, October, November for the Southern Hemisphere. Other seasons follow in order. July is the hottest and January the coldest month north of the equator, and vice-versa for places south of the equator, unless otherwise noted.

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